

REPORT NUMBER: 201U-CAL-10-06

**SAFETY COMPLIANCE TESTING FOR FMVSS 201
OCCUPANT PROTECTION IN INTERIOR IMPACT
UPPER INTERIOR HEAD IMPACT PROTECTION**

**TOYOTA MOTOR CORPORATION
2010 Lexus 250h**

NHTSA NUMBER: CA5102

CALSPAN TEST NUMBER: CC2010-06

CALSPAN
TRANSPORTATION SCIENCES CENTER
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BUFFALO, NEW YORK 14225



Test Date: April 5, 2010

FINAL REPORT

PREPARED FOR:

U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Enforcement
Office of Vehicle Safety Compliance
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Prepared by:



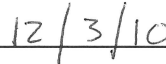
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16. <i>Abstract</i> Compliance tests were conducted on the subject vehicle, 2010 Lexus 250h, in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure TP-201U-01 for determination of FMVSS 201 compliance. Test failures identified were as follows in the table below:					
Target Point	Horizontal	Vertical	Velocity	HIC	HICd
None	-	-	-	-	-
None	-	-	-	-	-
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SECTION 1

PURPOSE AND TEST PROCEDURE

This head impact compliance test is part of the FMVSS 201 Upper Interior Head Impact Protection Test Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-09-D-00130. The purpose of this head impact compliance test was to determine whether the subject vehicle, a 2010 Lexus 250h, NHTSA No. CA5102, meets the performance requirements of FMVSS 201, Occupant Protection in Interior Impact. The compliance test was conducted in accordance with the OVSC Laboratory Test Procedure No. TP-201U-01 dated April 03, 1998.

SECTION 2

SUMMARY OF UPPER INTERIOR HEAD IMPACTS

A 2010 Lexus 250h , NHTSA No. CA5102, was tested at various upper interior locations by a 4.54 kg 50th percentile headform. A total of Twelve (12) impacts were performed in this test series. The target area impacts were chosen by the NHTSA Contracting Officer's Technical Representative (COTR). A summary of test results can be found on Data Sheet 2-1, Summary of Upper Interior Head Impact Tests. The Twelve (12) area chosen for testing were:

RP1	SR3	URBP	BP2
SR2A	AP3	AP1	BP3
BP1	AP2	FH1	SR1

The selected impact areas on the test vehicle appeared to comply with the performance requirements of FMVSS 201.

Five Free Motion Headforms (FMH) were used in this test series. All five FMH's were calibrated prior to and after the test series. Calibration information are included in Appendix B. Each FMH weighed 4.54 ± 0.5 kg and had an orthogonal tri-axis accelerometer pack mounted at the headform's center of gravity (c.g.).

A total of three (3) channels of data for each test were recorded on a Keyser-Threde data acquisition system. Data plots, along with still images, can be found in Section 3, Summary of Test Results and Data Plots.

To document each target area impact test, a Weinberger high-speed video camera was placed at an appropriate location to record the headform contact with the selected target area.

DATA SHEET 2-1

SUMMARY OF UPPER INTERIOR HEAD IMPACT TESTS

VEHICLE YEAR/MAKE/MODEL/STYLE:	2010 Lexus 250h
VIN:	JTHBB1BA5A2014110
DATE OF MANUFACTURE:	11/09 (SEE CERTIFICATION LABEL)
COLOR:	Red

TARGET CODE	Target Coordinates						Approach Angles (degrees)		Velocity (kph)	FMH HIC	HIC(d)
	Driver Side			Passenger Side							
	X(mm)	Y(mm)	Z(mm)	X(mm)	Y(mm)	Z(mm)	Horizontal	Vertical			
AP1	2033.5499	-512.9192	2125.3423	2033.5891	515.0967	2121.7009	Relocated 2 circle		-	-	-
AP1 R2	2047.1497	-527.4598	2088.9675	2036.8332	531.9911	2079.5798	120	20	18.56	163.7	289.9
AP2	1941.5576	-557.7034	2038.0161	1933.2896	558.3242	2034.8935	203	50	18.34	311.4	401.3
AP3	1760.0307	-593.2095	1972.7539	1755.0791	596.1088	1969.5513	117	35	18.49	328.3	414.1
FH1	1963.4917	-398.9583	2134.3531	1961.3550	398.4647	2130.4651	180	50	23.86	295.8	389.6
FH2	1954.8560	-250.0729	2144.4198	1950.8553	251.0968	2140.9301	Relocated 1 circle		-	-	-
FH2 R1	1945.3797	-266.5254	2139.2146	1944.7202	271.8698	2136.3471	-	-	-	-	-
SR1	2183.1244	-495.1139	2127.9152	2182.9748	491.9304	2128.4058	Relocated 2 circles		-	-	-
SR1 R2	2183.3250	-520.6243	2106.5357	2183.8466	521.4732	2105.7458	270	38	18.42	437.1	496.1
SR2A	2333.2356	-497.1825	2154.4061	2331.3383	496.6131	2154.1379	Relocated 2 circles				
SR2A R2	2345.1563	-479.6757	2121.0174	2360.0092	483.3189	2119.4249	90	50	18.31	360.7	438.5
SR2B	2307.4036	-495.5205	2155.4840	2305.9092	495.3533	2154.3849	Relocated 2 circles		-	-	-
SR2B R2	2310.9138	-480.2317	2121.2297	2308.6894	485.3672	2118.0652	-	-	-	-	-
BP1	2608.2746	-464.3002	2139.3120	2607.2854	464.8486	2137.7919	Relocated 2 circles		-	-	-
BP1 R2	2608.5637	-428.7467	2142.9049	2606.6583	432.5206	2140.8653	270	25	18.37	265.0	366.3
BP2	2581.1734	-575.6827	1945.9609	2574.0328	577.9937	1942.3366	90	12	23.93	564.2	592.1
BP3	2514.9241	-604.3488	1947.0787	2512.9180	605.6711	1943.9317	285	-8	23.69	394.7	464.2
BP4	2644.5575	-639.7909	1849.0724	2642.3659	639.2241	1849.0461	-	-	-	-	-
CGF1	2276.8523	-349.7309	2162.8947	2274.6103	351.7503	2159.9011	-	-	-	-	-
CGF2	2535.9456	-350.5061	2160.5715	2533.3308	351.6288	2157.2381	-	-	-	-	-
SR3	3203.4139	-504.5191	2087.6499	3196.3167	499.5477	2088.9545	90	38	18.58	204.3	320.5
UR BP	3238.0800	-368.0789	2140.8707	2606.2303	383.7416	2147.9116	90	50	23.61	710.5	702.4
RP1	3403.5978	-491.2362	2094.8204	3405.2264	492.2257	2094.4135	35	42	18.53	224.8	336.0
RP2	3421.8942	-600.4155	1948.2140	3427.9327	597.9934	1947.6548	-	-	-	-	-
RH	3377.2214	-346.2586	2127.1746	3378.0831	345.1526	2126.4134	-	-	-	-	-
CGR	3313.9409	-345.5602	2141.1229	3312.1662	344.2583	2140.3715	-	-	-	-	-

*HIC(d)=0.75446(Free Motion Headform HIC)+166.4

DATA SHEET 2-2

GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:									
Year/Make/Model/Body Style:				2010 Lexus 250h					
VIN:				JTHBB1BA5A2014110					
Month & Year of Manufacture:				11/09 (SEE CERTIFICATION LABEL)					
Vehicle Body Color:				Red					
Engine Data:	4	Cylinders;		CID;	2.4	Liters;	-	cc	
Engine Placement:	X		Longitudinal;	or				Lateral	
Transmission:		Speed;		Manual;	X	Automatic;		Overdrive	
Final Drive:		Rear Wheel Drive;	X	Front Wheel Drive;		Four Wheel Drive			
Odometer Reading:	19.3		km						
Options:	X	A/C;	X	Power Steering;	X	Pwr.Brakes;	X	Pwr. Windows	
Interior Trim Information :									
1.									
2.									
3.									

DATA FROM TIRE PLACARD:									
Tire Pressure (at capacity);				230		kPa FRONT			
				230		kPa REAR			
Recommended Tire Size:									
Tires on Test Vehicle:		P215/55R17		Manufacturer:		Michelin			
Vehicle Capacity Data:									
Number of Occupants:	2	Front;	3	Rear;		3rd Seat;	5	Total	
Type of Front Seats:	X	Bucket;		Bench;		Split Bench			
Type of Front Seat Back:		Fixed;	X	Adjustable with	X	Lever or		Knob	
Vehicle Capacity Weight (VCW)=				375		kg (A)			
No. of Occupants x 68 kg. =				340		kg (B)			
Rated Cargo/Luggage Weight (RCLW) =				35		kg (A-B) Max. RCLW = 136 kg.			

DATA SHEET 2-2

GENERAL TEST AND VEHICLE PARAMETER DATA (cont.)

TEST VEHICLE DELIVERED WEIGHT WITH MAXIMUM FLUIDS:					
Left Front	=	505.0	kg	Left Rear	= 340.5 kg
Right Front	=	497.5	kg	Right Rear	= 320.5 kg
TOTAL FRONT	=	1002.5	kg	TOTAL REAR	= 661.0 kg
% of Total Weight	=	60.3	%	% of Total Weight	= 39.7 %
TOTAL WEIGHT	=	1663.5		kg	

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:		
Total Test Vehicle Delivered Weight=	1663.5	kg (A)
+ Rated Cargo/Luggage Weight =	35	kg (B)
TEST VEHICLE TARGET WEIGHT =	1698.5	kg (A+B)

WEIGHT OF TEST VEHICLE (FULLY LOADED):					
Left Front	=	504.0	kg	Left Rear	= 355.5 kg
Right Front	=	497.0	kg	Right Rear	= 336.0 kg
TOTAL FRONT	=	1001.0	kg	TOTAL REAR	= 691.5 kg
% of Total Weight	=	59.1	%	% of Total Weight	= 40.9 %
TOTAL TEST WEIGHT	=	1692.5			
Weight of vehicle secured in test vehicles cargo area	=	29		kg	

TEST VEHICLE ATTITUDE (all dimensions in millimeters):				
AS DELIVERED:	Left Front	734	Left Rear	754
	Right Front	738	Right Rear	749
FULLY LOADED:	Left Front	730	Left Rear	746
	Right Front	734	Right Rear	740
Test Vehicle Wheelbase:		2705	millimeters	

TEST VEHICLE PITCH AND ROLL ANGLES:				
AS DELIVERED:	PITCH ANGLES		ROLL ANGLES	
	Left Door Sill	↑0.8↓	Front Bumper	0.0
	Right Door Sill	↓0.8↑	Rear Bumper	0.0
FULLY LOADED:	PITCH ANGLES		ROLL ANGLES	
	Left Door Sill	↑0.7↓	Front Bumper	0.0
	Right Door Sill	↓0.7↑	Rear Bumper	0.0
AS TESTED:	PITCH ANGLES		ROLL ANGLES	
	Left Door Sill	↑0.8↓	Front Bumper	0.0
	Right Door Sill	↓0.8↑	Rear Bumper	0.0

DATA SHEET 2-3

APPROACH ANGLE LIMITS

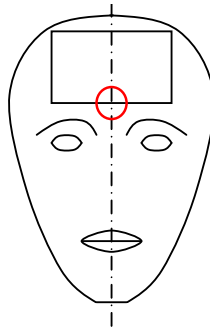
Left Side					Right Side				
Target Code	Horizontal Angles (deg.)		Vertical Angles (deg.)		Target Code	Horizontal Angles (deg.)		Vertical Angles (deg.)	
	Minimum	Maximum	Minimum	Maximum		Minimum	Maximum	Minimum	Maximum
AP1	199*	241*	-5	N/A	AP1	116*	161*	-5	20
AP2	199*	241*	-5	50	AP2	116*	161*	-5	N/A
AP3	199*	241*	-5	N/A	AP3	116*	161*	-5	50
BP1	203*	287*	-10	25	BP1	90*	156*	-10	25
BP2	Any		0	12	BP2	Any		0	12
BP3	203*	287*	-10	-8	BP3	90*	156*	-10	N/A
BP4	203*	287*	-10	N/A	BP4	90*	156*	-10	N/A
OP1	270		-10	25	OP1	90		-10	25
OP2	270		-10	12	OP2	90		-10	12
RP1	270	345	-10	42	RP1	15	90	-10	42
RP2	270	345	-10	N/A	RP2	15	90	-10	N/A
FH1	180		0	50	FH1	180		0	50
FH2	180		0	N/A	FH2	180		0	N/A
RH	360		0	N/A	RH	0		0	N/A
SR1	270		0	38	SR1	90		0	38
SR2A	270		0	50	SR2A	90		0	50
SR2B	270		0	N/A	SR2B	90		0	N/A
SR3	270		0	38	SR3	90		0	38
SR3GH	270		0	38	SR3GH	90		0	38
URAP	ANY		0	N/A	URAP	ANY		0	N/A
URBP	ANY		0	50	URBP	ANY		0	50
URRP	ANY		0	N/A	URRP	ANY		0	N/A

Note: * Estimated value based on FARO measurements
 N/A - Not Available

DATA SHEET 2-4

SUMMARY TARGET IMPACT LOCATION ON FMH

VEHICLE YEAR/MAKE/MODEL/STYLE:	2010 Lexus 250h
VIN:	JTHBB1BA5A2014110
DATE OF MANUFACTURE:	11/09 (SEE CERTIFICATION LABEL)
COLOR:	Red



↖ RIGHT SIDE OF FACE

TARGET	Distance Above Point 0 (mm)	Distance Over From Pt. O (mm)
RP1	35	-15L
SR3	12	-15L
URBP	44	-1L
BP2	9	17R
SR2A	16	-1L
AP3	39	7R
AP1	7	33R
BP3	10	-28L
BP1	81	-9L
AP2	19	-6L
FH1	36	-1L
SR1	55	15R

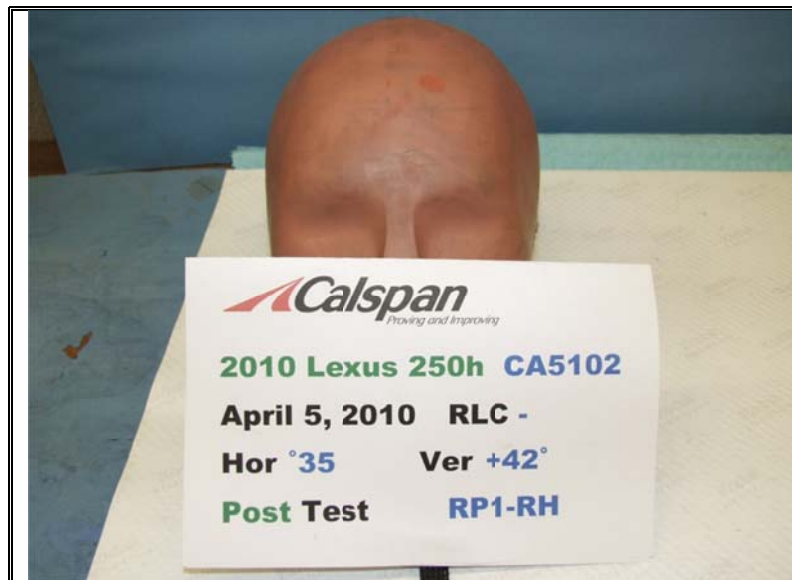
SECTION 3

SUMMARY OF TEST RESULTS AND DATA PLOTS

VEHICLE YEAR/MAKE/MODEL/STYLE:	2010 Lexus 250h
VIN:	JTHBB1BA5A2014110
DATE OF MANUFACTURE:	11/09 (SEE CERTIFICATION LABEL)
COLOR:	Red

Test Number:	01
Test Date:	5 April 2010
Target Location:	RP1 RH
Target Code:	RP1 RH
Horizontal Impact Angle:	35
Vertical Impact Angle:	42
Ambient Temperature:	21°
Relative Humidity:	37.6%
Time of Impact:	2:02
Headform Number:	1142

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	-15	<input type="checkbox"/>	mm right <input checked="" type="checkbox"/> mm left
On Centerline	35		mm up



POST-IMPACT RP1 RH HEADFORM

Free Motion HIC	224.8
HIC(d)	336.0
Impact Velocity (kph)	18.53
HIC T1 (msec)	4.5
HIC T2 (msec)	12.8

RP1 RH Side CA5102 - RP1-RH

FMH Headform 1142

Location: RP1-RH

Test Date: April 05, 2010

Work File: fmh

TEST RESULTS

Lab Temperature: 21 C

HICd: 336.0

Lab Humidity: 37.6 %

HIC (36ms): 224.8

Velocity at Impact: 18.53 KPH

t1: 4.5 msec

t2: 12.8 msec

Free Flight Distance: 220.25 mm

Duration: 8.3 msec

Maximum: 77.5 g

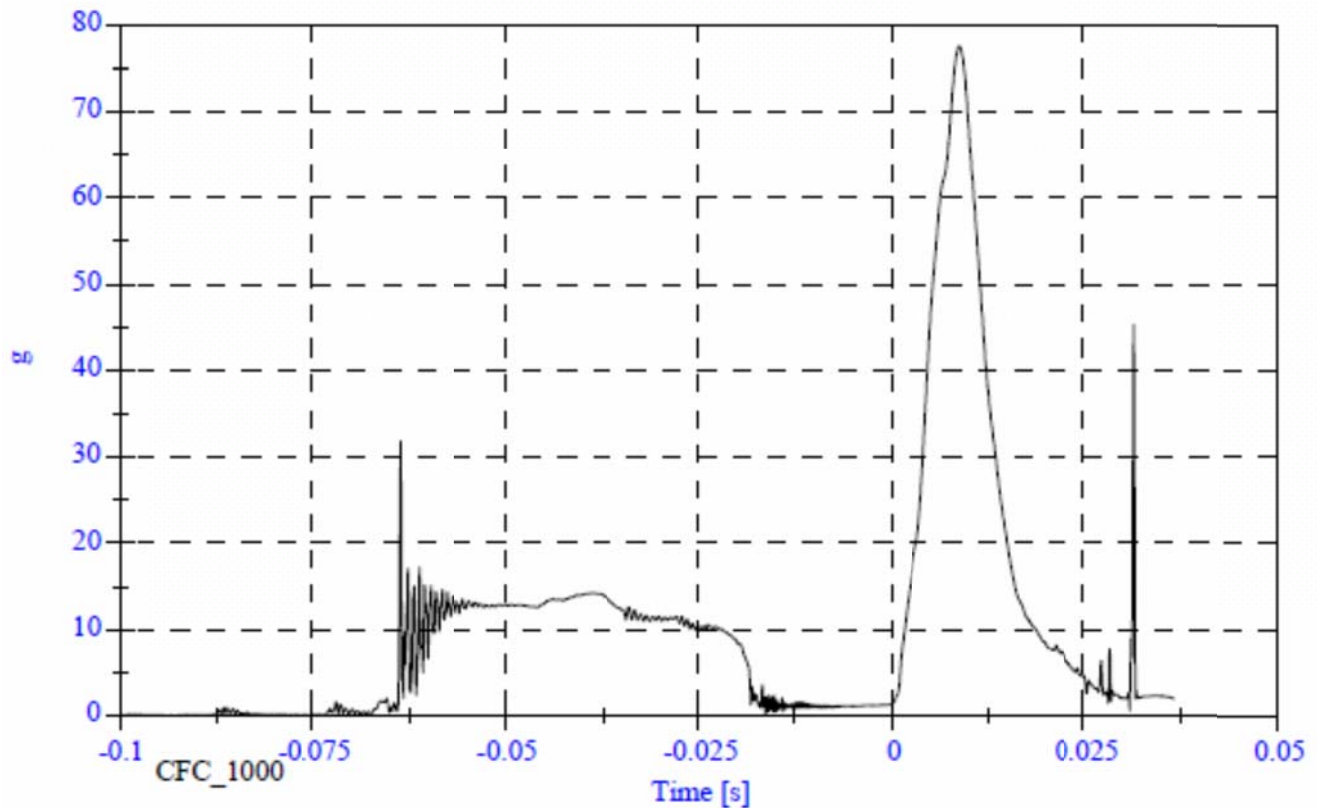
Average Acceleration: 9.7 g

RP1 RH Side

Headform Resultant

Max: 77.5 [g] at 0.009 [s]

Min: 0.0 [g] at -0.094 [s]

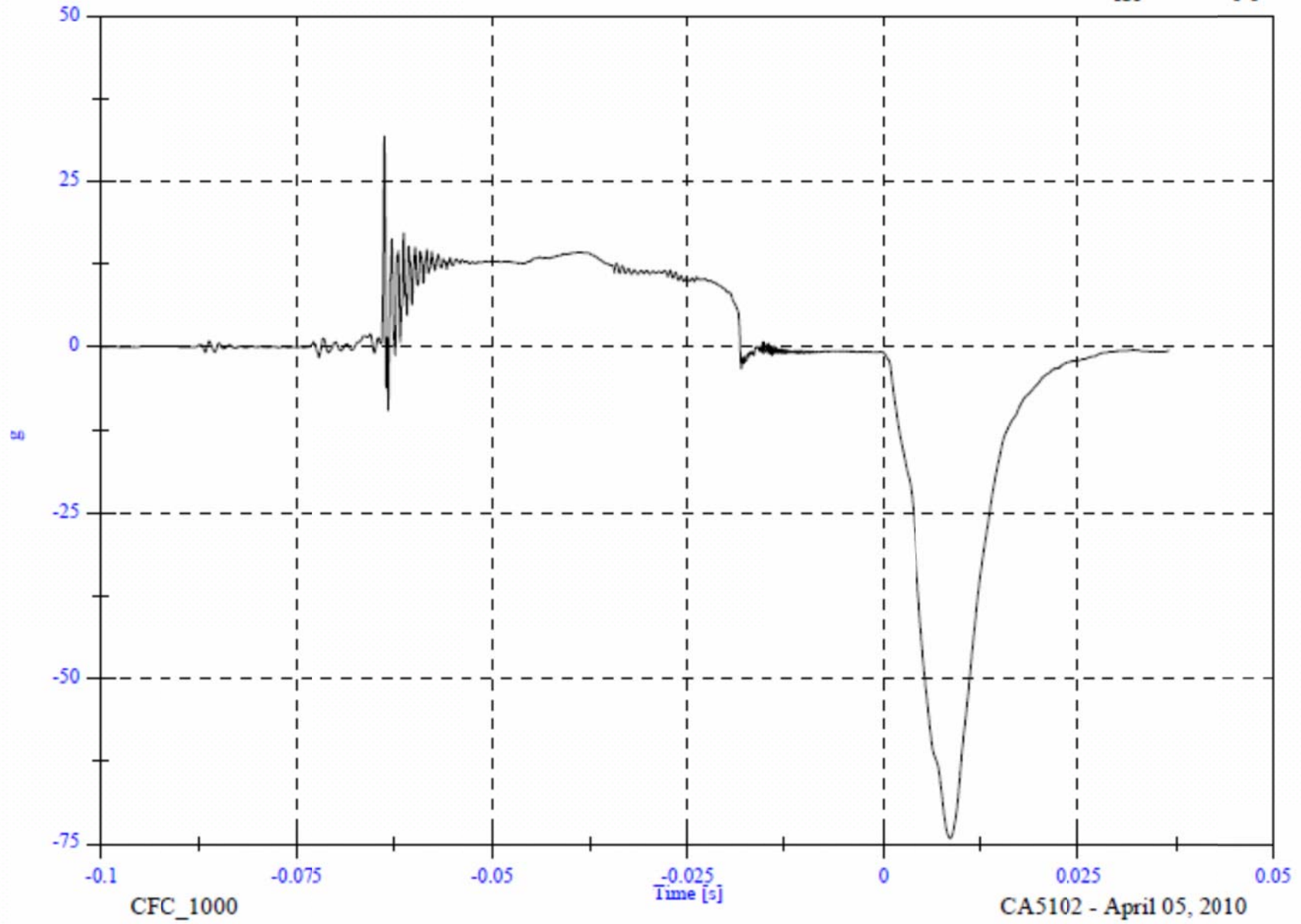


RP1 RH Side

Headform X Acceleration

Max: 31.7 [g] at -0.064 [s]

Min: -74.1 [g] at 0.009 [s]

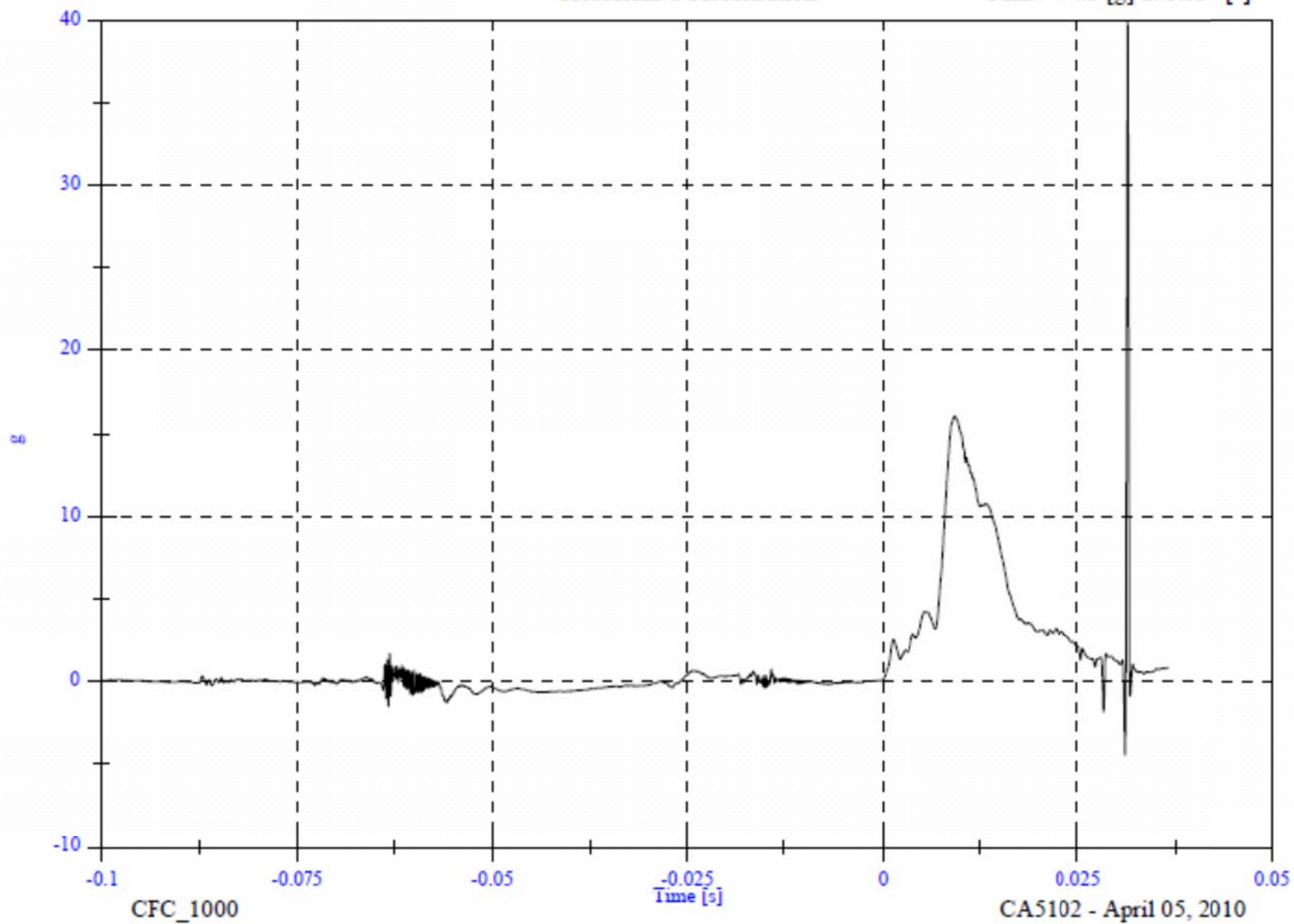


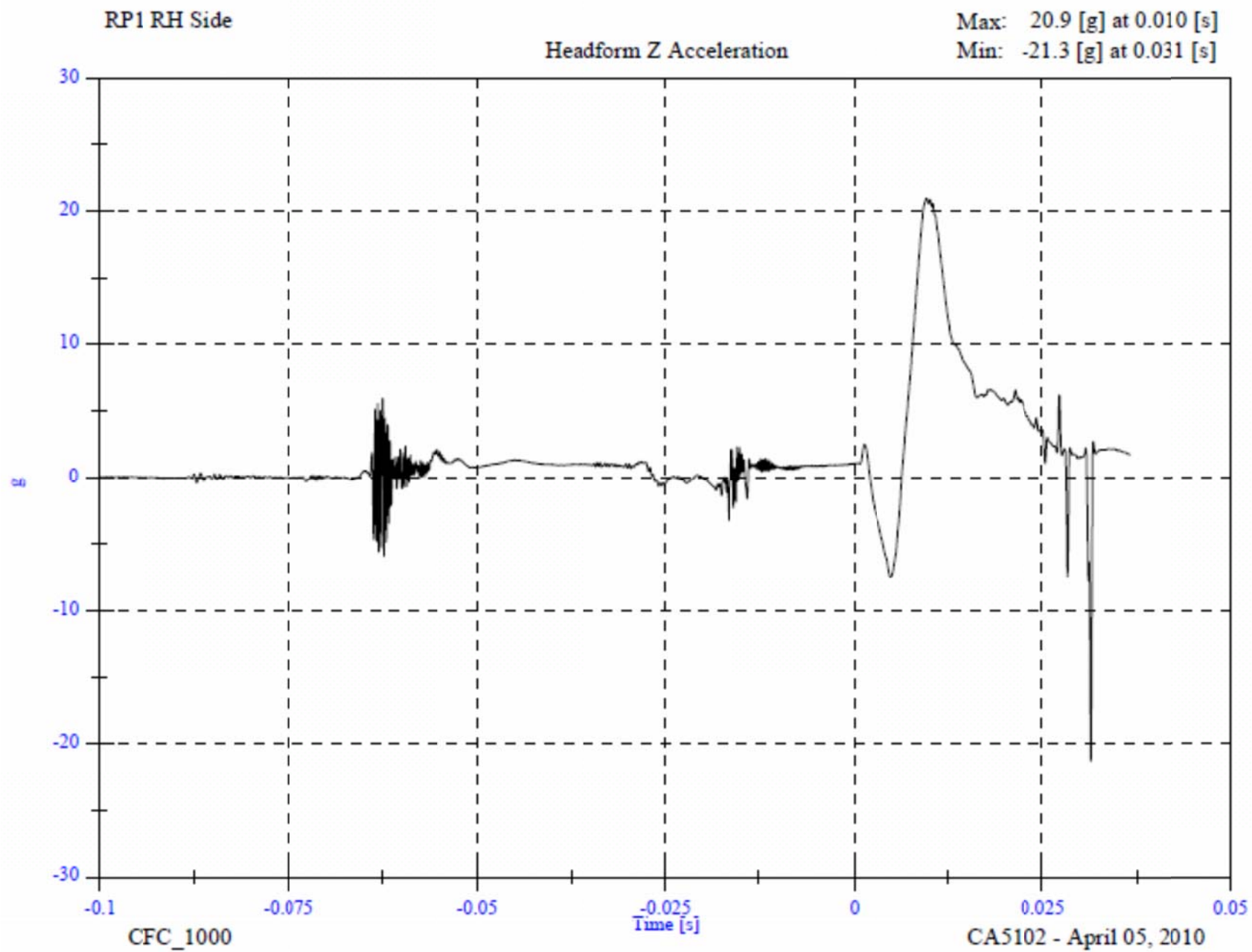
RP1 RH Side

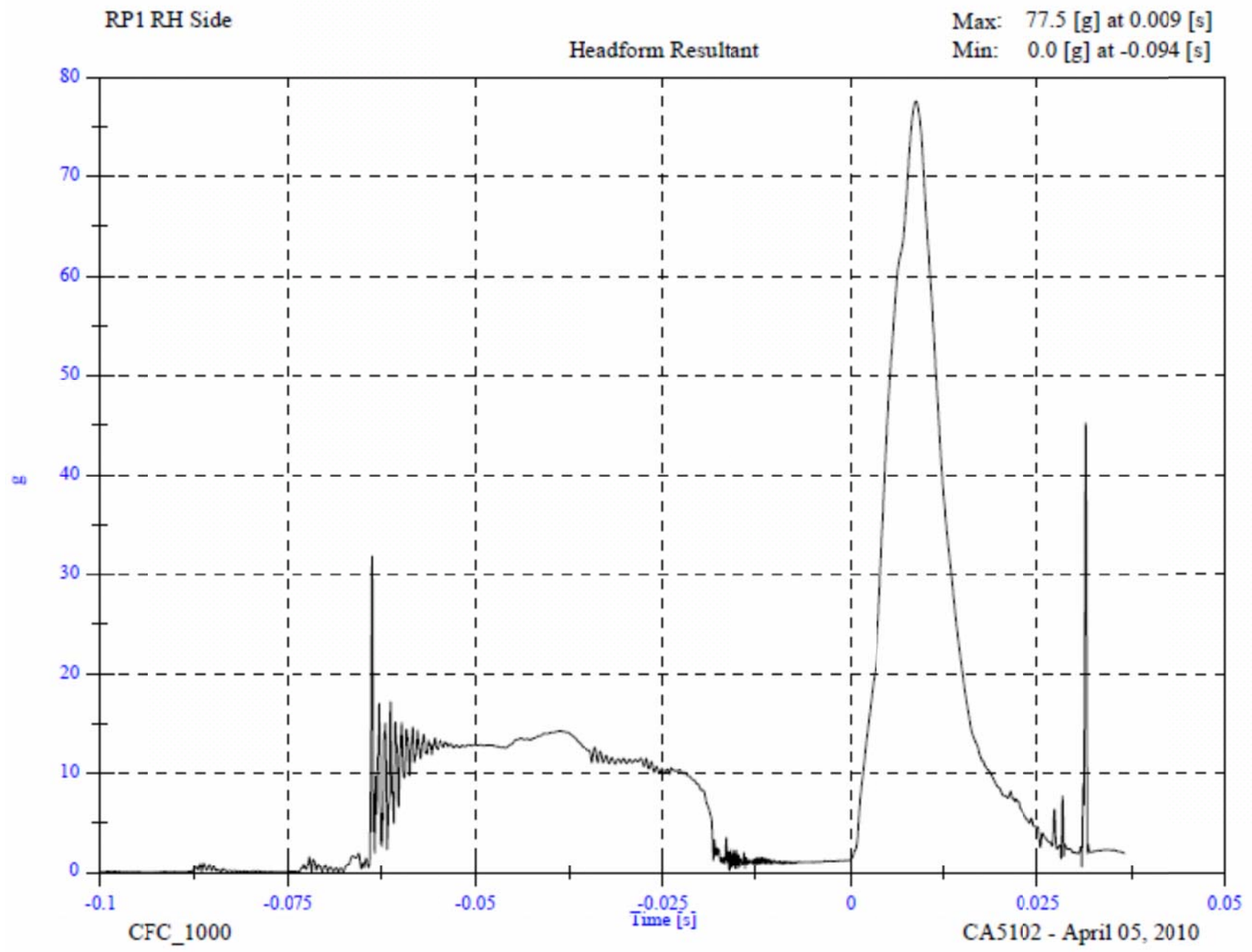
Headform Y Acceleration

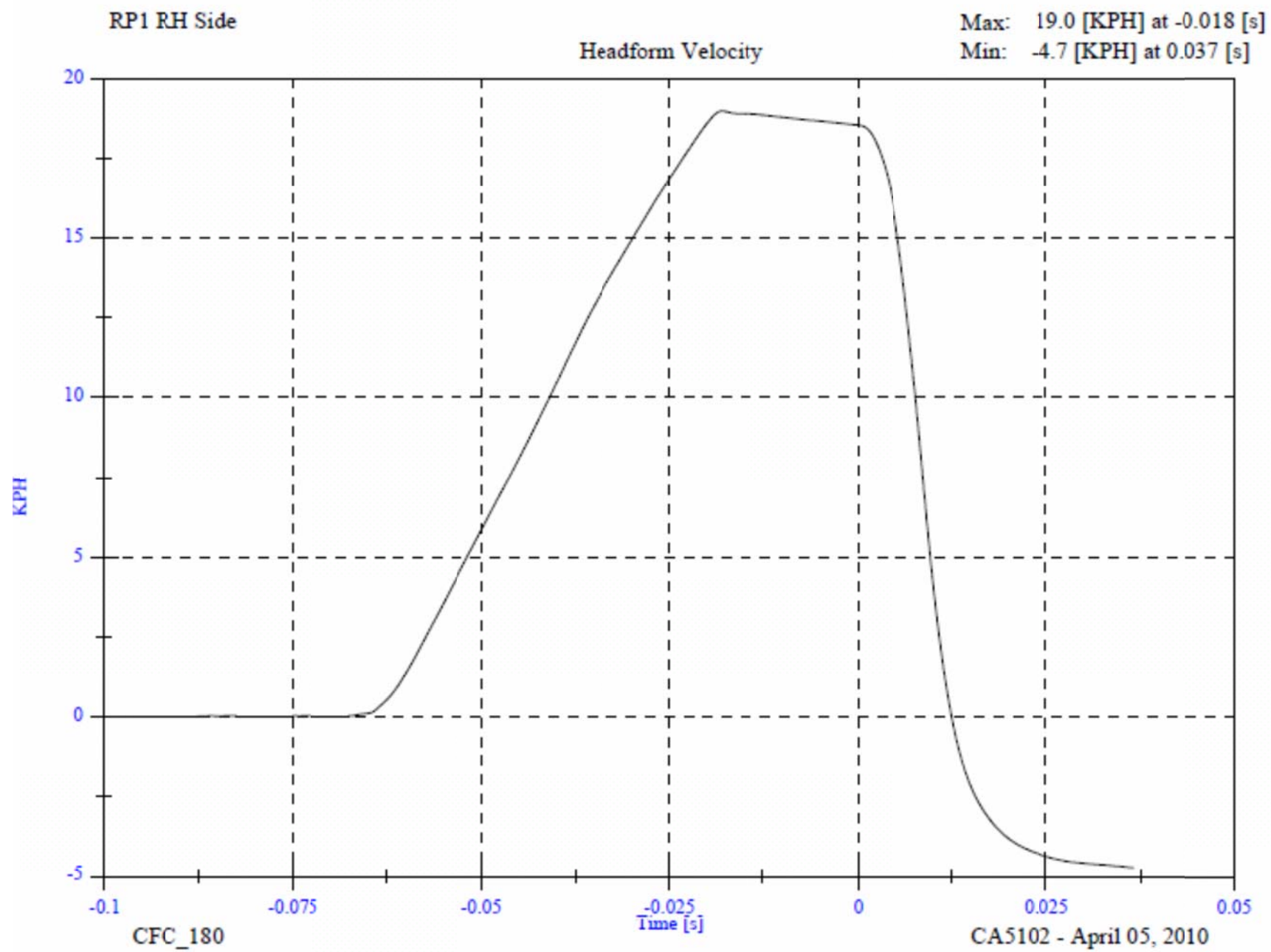
Max: 39.9 [g] at 0.031 [s]

Min: -4.5 [g] at 0.031 [s]



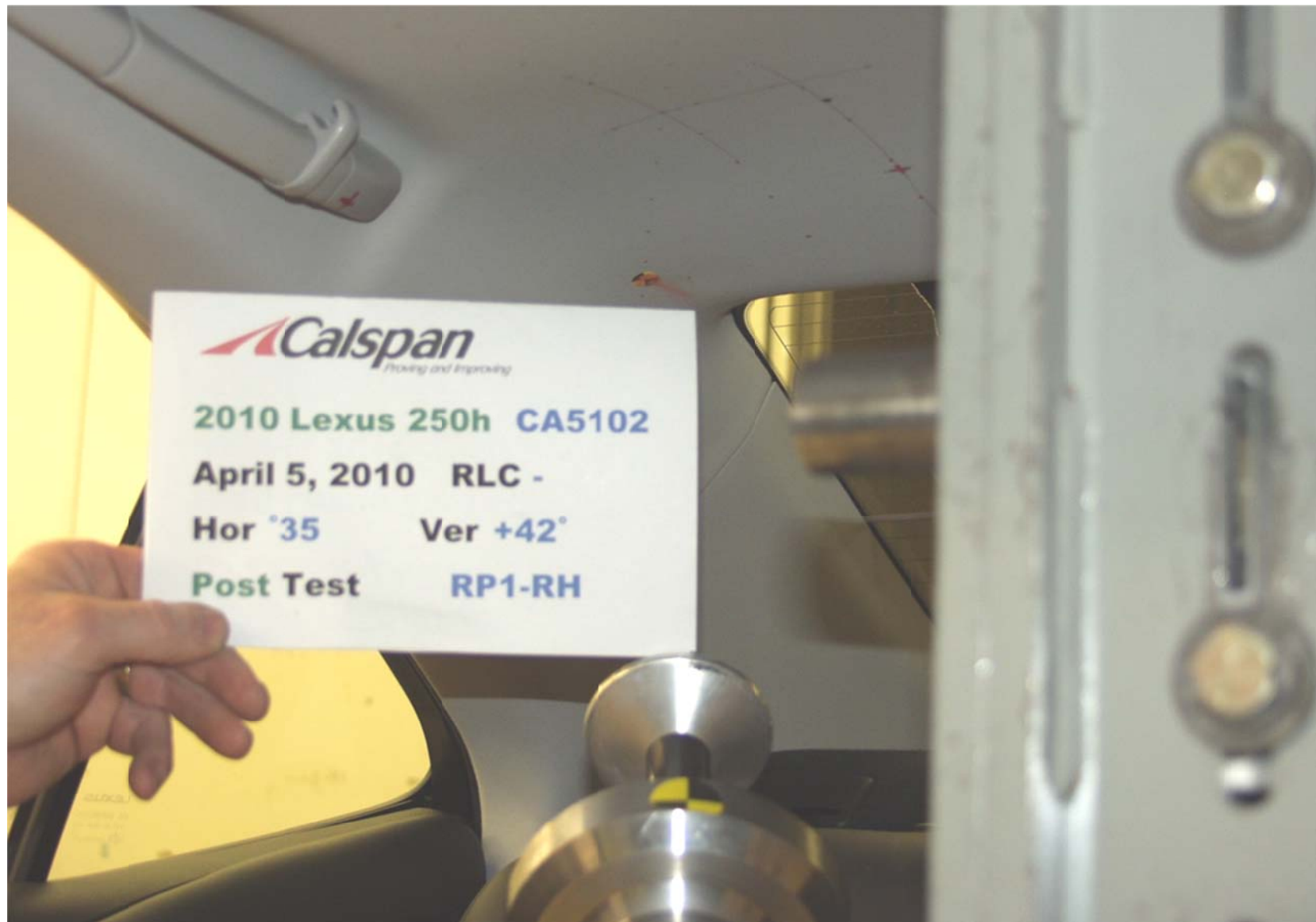








PRE-IMPACT RP1 RH



POST-IMPACT RP1 RH

VEHICLE YEAR/MAKE/MODEL/STYLE:	2010 Lexus 250h
VIN:	JTHBB1BA5A2014110
DATE OF MANUFACTURE:	11/09 (SEE CERTIFICATION LABEL)
COLOR:	Red

Test Number:	02
Test Date:	5 April 2010
Target Location:	SR3 RH
Target Code:	SR3 RH
Horizontal Impact Angle:	90
Vertical Impact Angle:	38
Ambient Temperature:	21
Relative Humidity:	37.6%
Time of Impact:	2:45
Headform Number:	0805

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	-15	<input type="checkbox"/>	mm right <input checked="" type="checkbox"/> mm left
On Centerline	12		mm up



POST-IMPACT SR3 RH HEADFORM

Free Motion HIC	204.3
HIC(d)	320.5
Impact Velocity (kph)	18.58
HIC T1 (msec)	1.6
HIC T2 (msec)	15.3

SR3 RH Side CA5102 - SR3A-RH

FMH Headform 0805

Location: SR3A-RH

Test Date: April 05, 2010

Work File: fmh

-----TEST RESULTS-----

Lab Temperature: 21 C

HICd: 320.5

Lab Humidity: 37.6 %

HIC (36ms): 204.3

Velocity at Impact: 18.58 KPH

t1: 1.6 msec

t2: 15.3 msec

Free Flight Distance: 225.86 mm

Duration: 13.7 msec

Maximum: 58.4 g

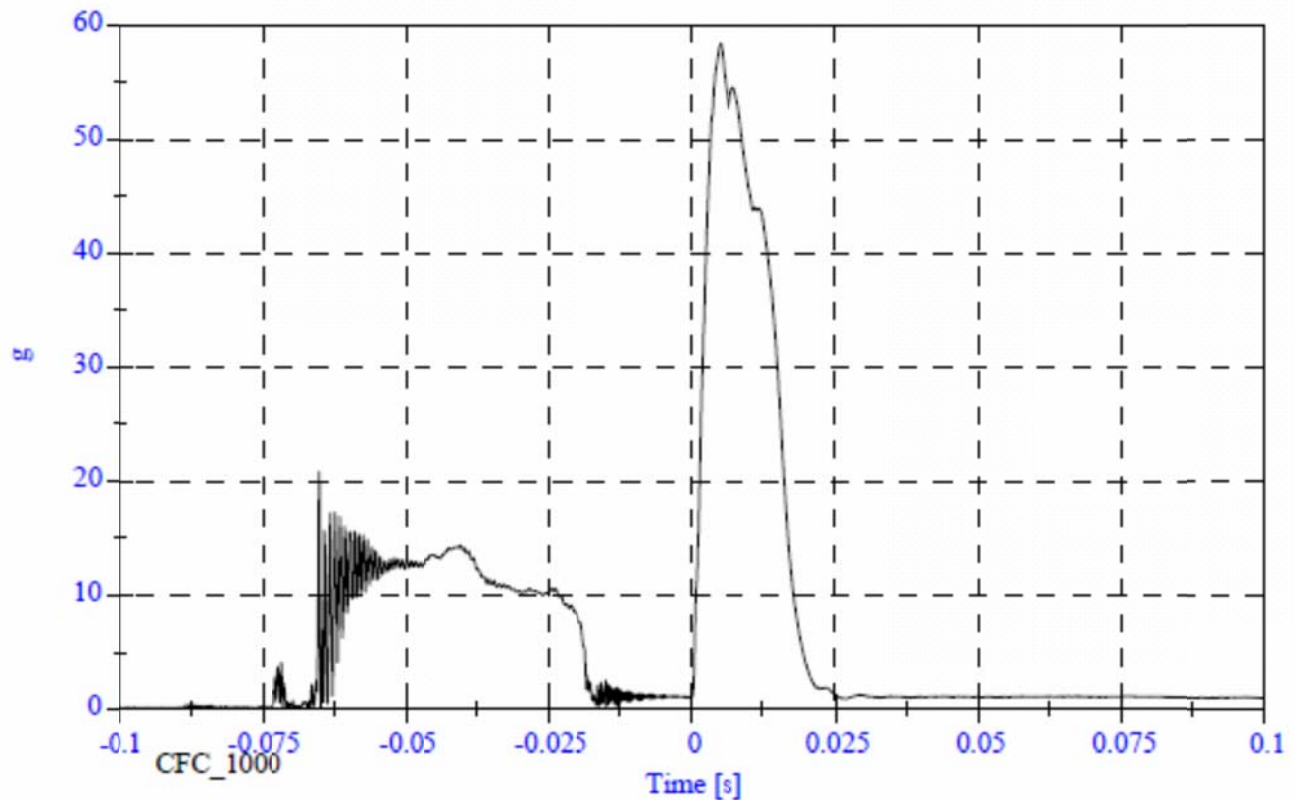
Average Acceleration: 6.9 g

SR3 RH Side

Headform Resultant

Max: 58.4 [g] at 0.005 [s]

Min: 0.0 [g] at -0.091 [s]

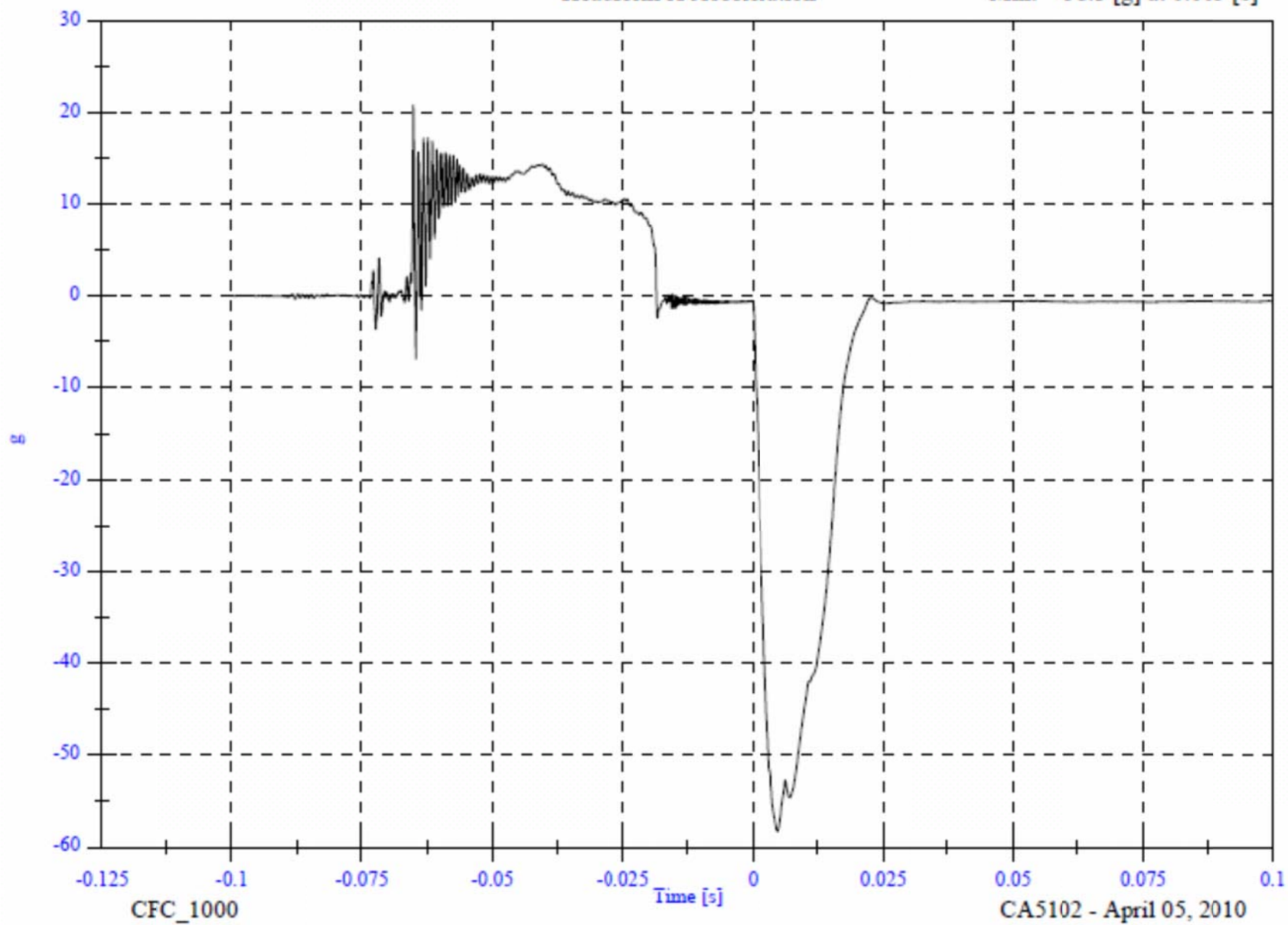


SR3 RH Side

Headform X Acceleration

Max: 20.8 [g] at -0.065 [s]

Min: -58.3 [g] at 0.005 [s]

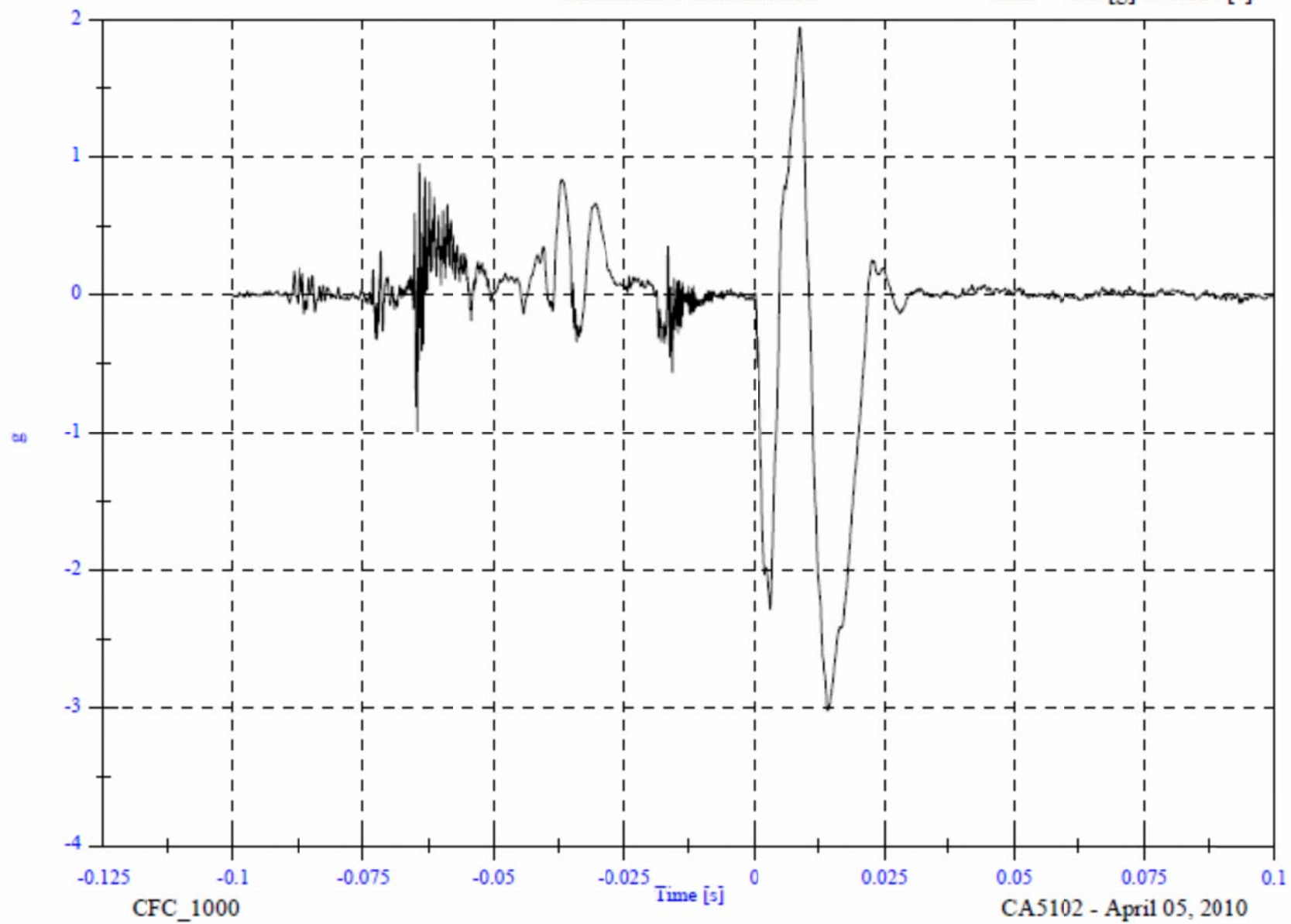


SR3 RH Side

Headform Y Acceleration

Max: 1.9 [g] at 0.009 [s]

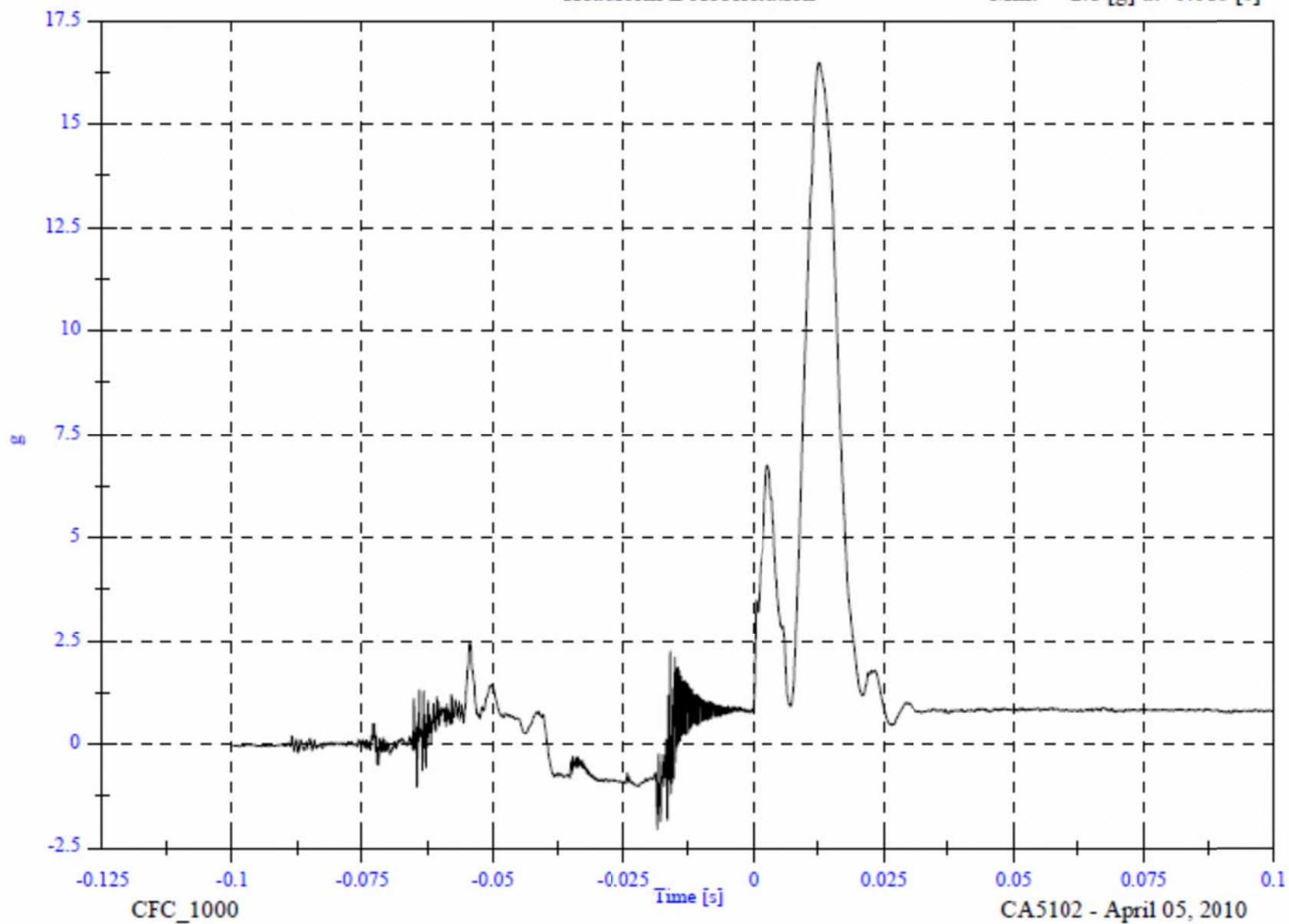
Min: -3.0 [g] at 0.014 [s]

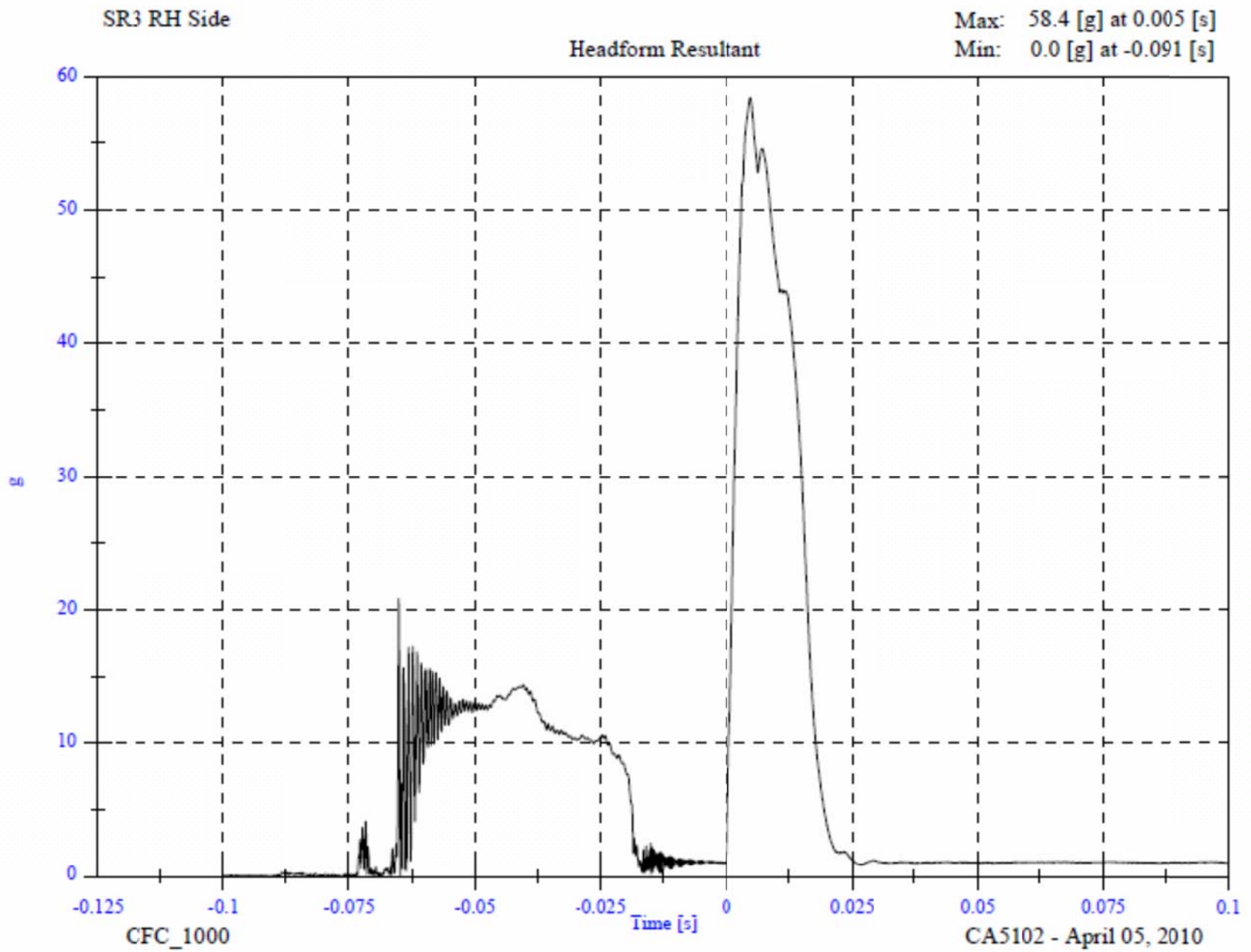


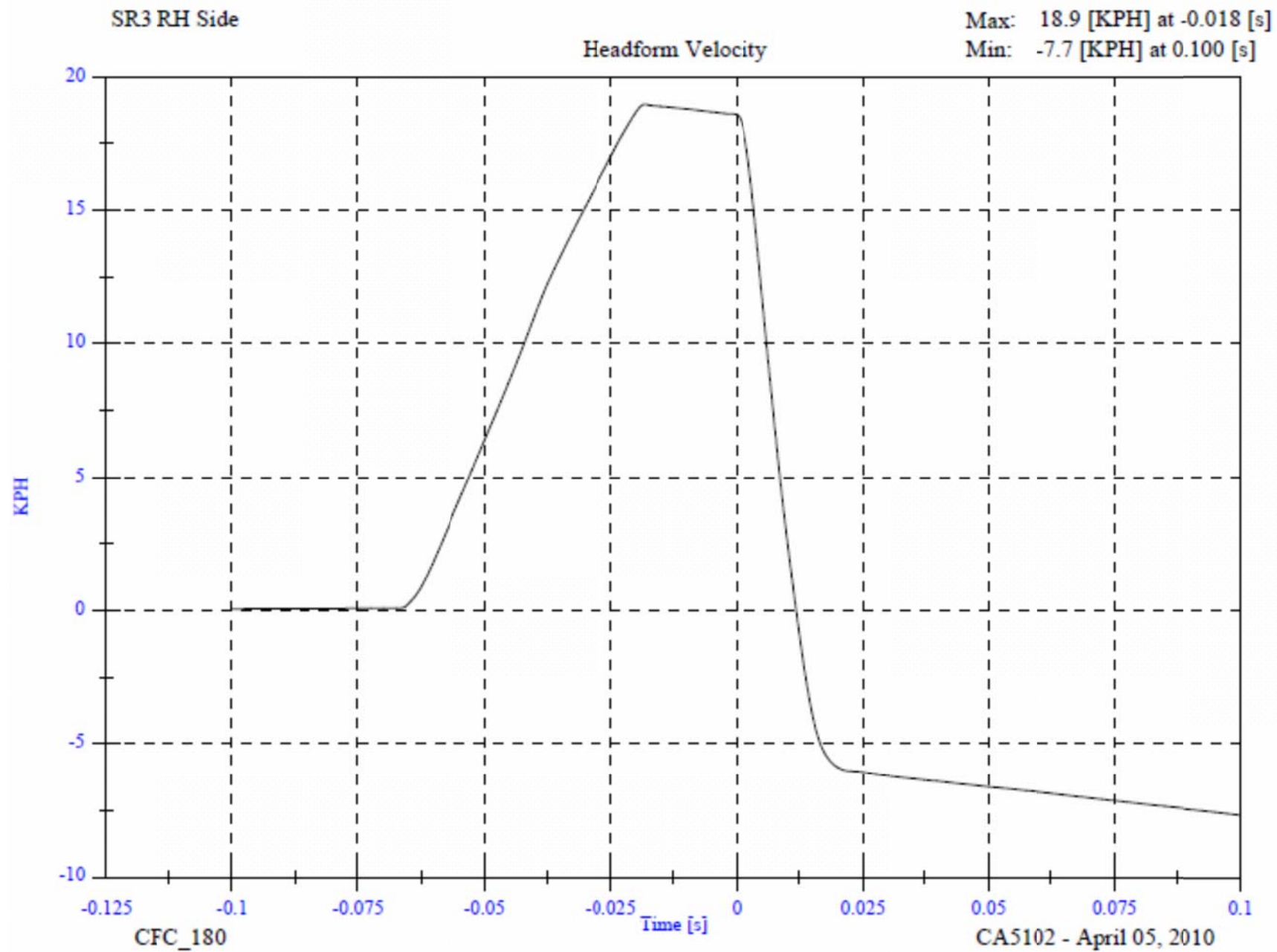
SR3 RH Side

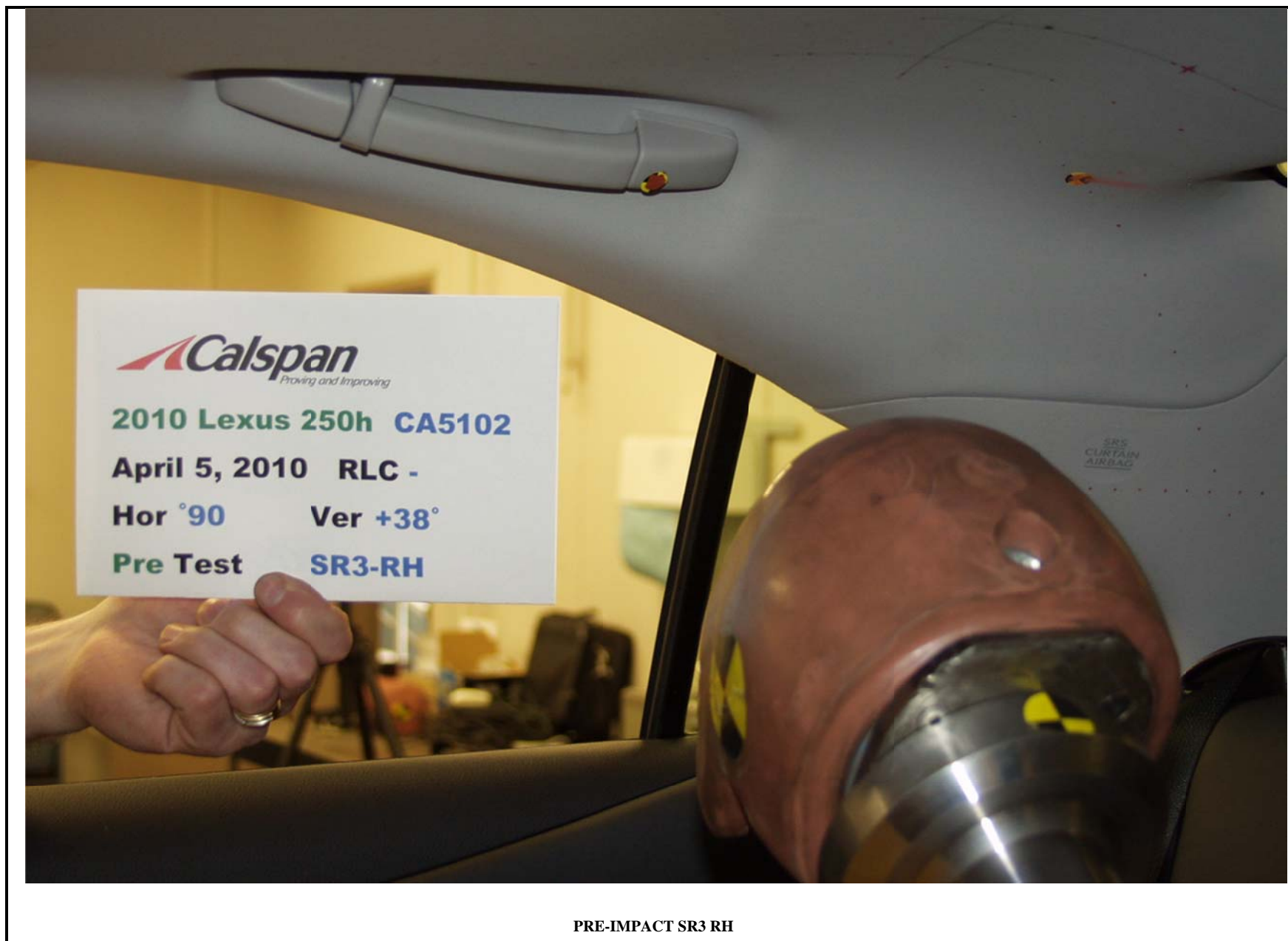
Headform Z Acceleration

Max: 16.5 [g] at 0.013 [s]
Min: -2.1 [g] at -0.018 [s]

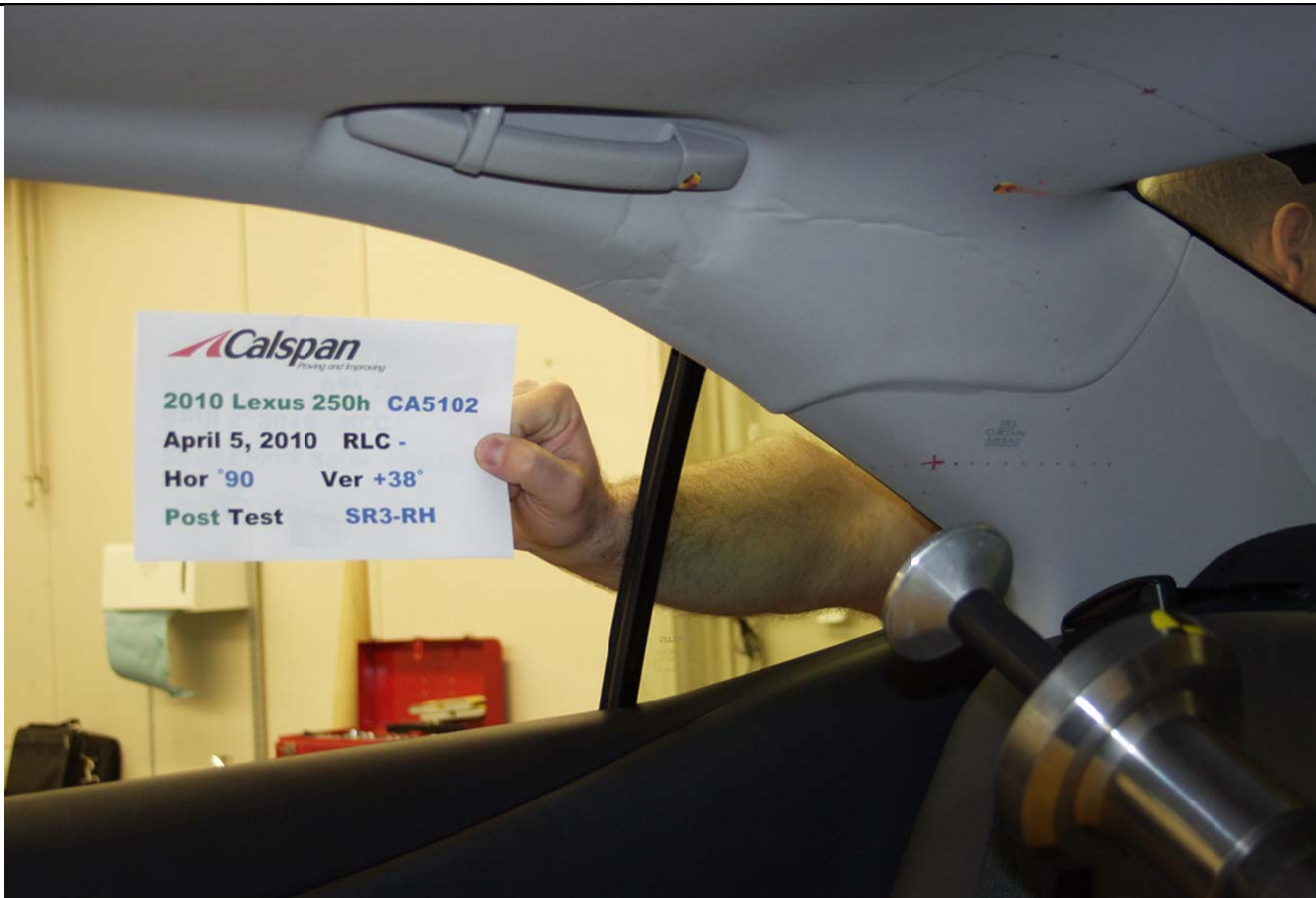








PRE-IMPACT SR3 RH



POST-IMPACT SR3 RH

VEHICLE YEAR/MAKE/MODEL/STYLE:	2010 Lexus 250h
VIN:	JTHBB1BA5A2014110
DATE OF MANUFACTURE:	11/09 (SEE CERTIFICATION LABEL)
COLOR:	Red

Test Number:	03
Test Date:	11 May 2010
Target Location:	URBP RH
Target Code:	URBP RH
Horizontal Impact Angle:	90
Vertical Impact Angle:	50
Ambient Temperature:	21
Relative Humidity:	37.3%
Time of Impact:	3:50
Headform Number:	0355

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	-1	<input type="checkbox"/>	mm right <input checked="" type="checkbox"/> mm left
On Centerline	44		mm up



POST-IMPACT URBP RH HEADFORM

Free Motion HIC	710.5
HIC(d)	702.4
Impact Velocity (kph)	23.6
HIC T1 (msec)	2.3
HIC T2 (msec)	10.6

URBP RH Side CA5102 - URBP-RH

FMH Headform 0355

Location: URBP-RH

Test Date: April 05, 2010

Work File: fmh

-----TEST RESULTS-----

Lab Temperature: 21 C

HICd: 702.4

Lab Humidity: 37.3 %

HIC (36ms): 710.5

Velocity at Impact: 23.61 KPH

t1: 2.3 msec

t2: 10.6 msec

Free Flight Distance: 226.73 mm

Duration: 8.3 msec

Maximum: 114.5 g

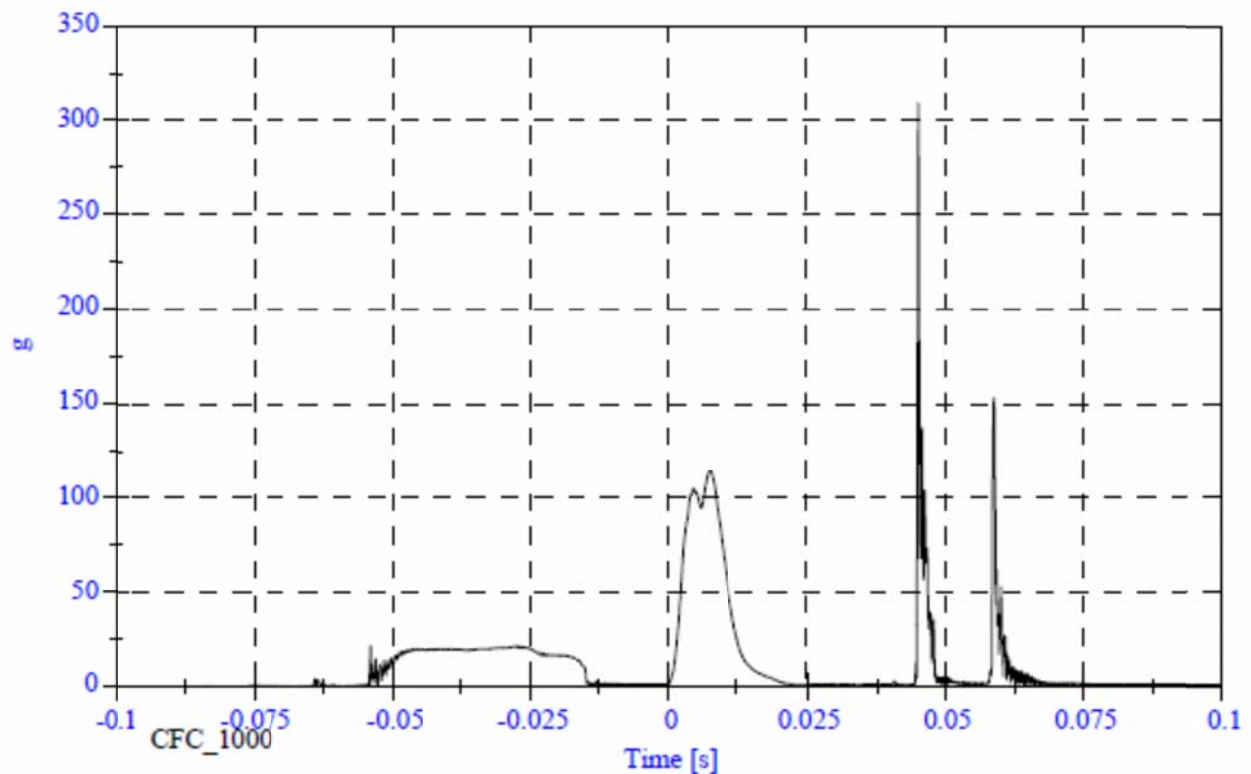
Average Acceleration: 11.0 g

URBP RH Side

Max: 114.5 [g] at 0.008 [s]

Headform Resultant

Min: 0.0 [g] at -0.097 [s]

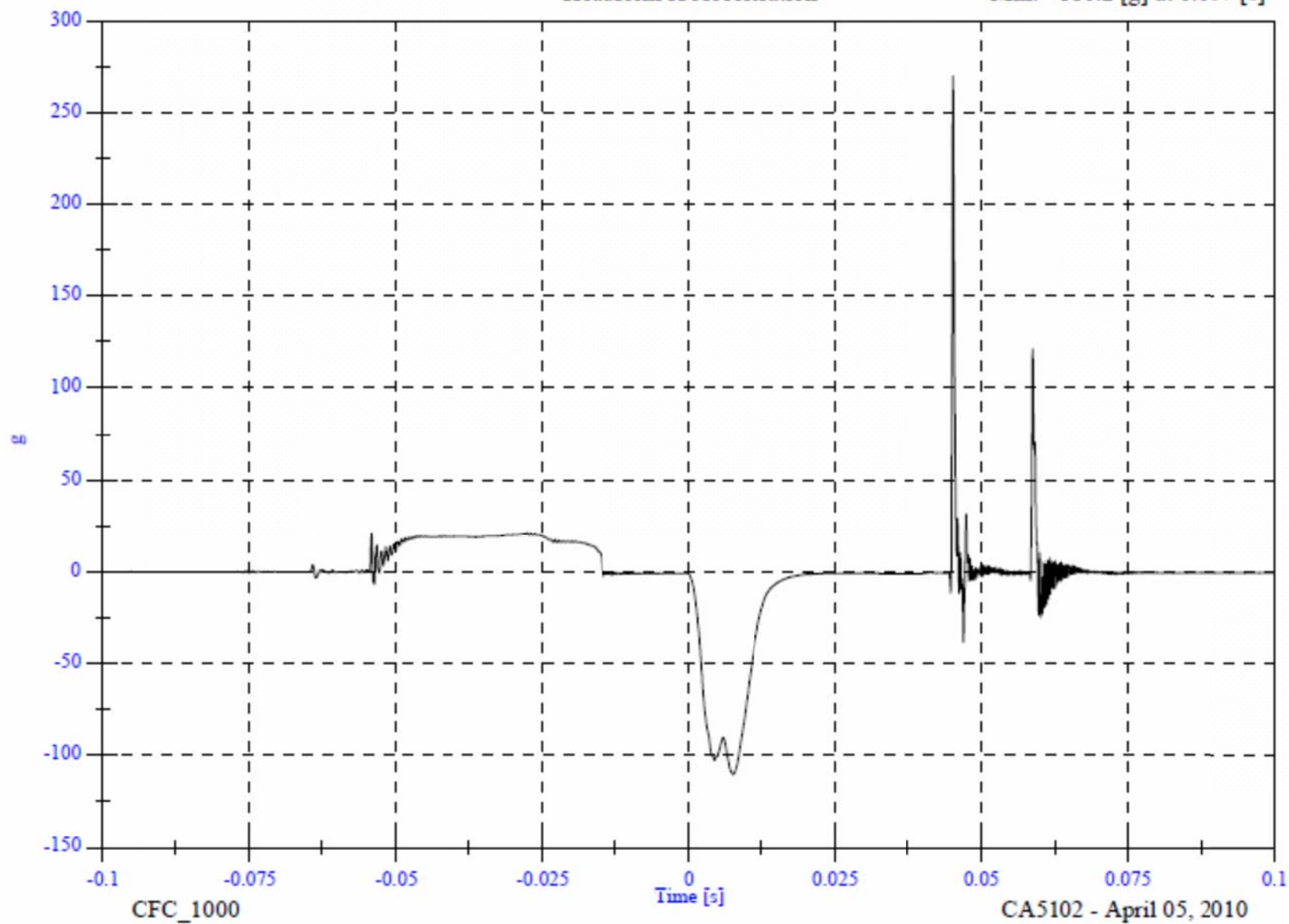


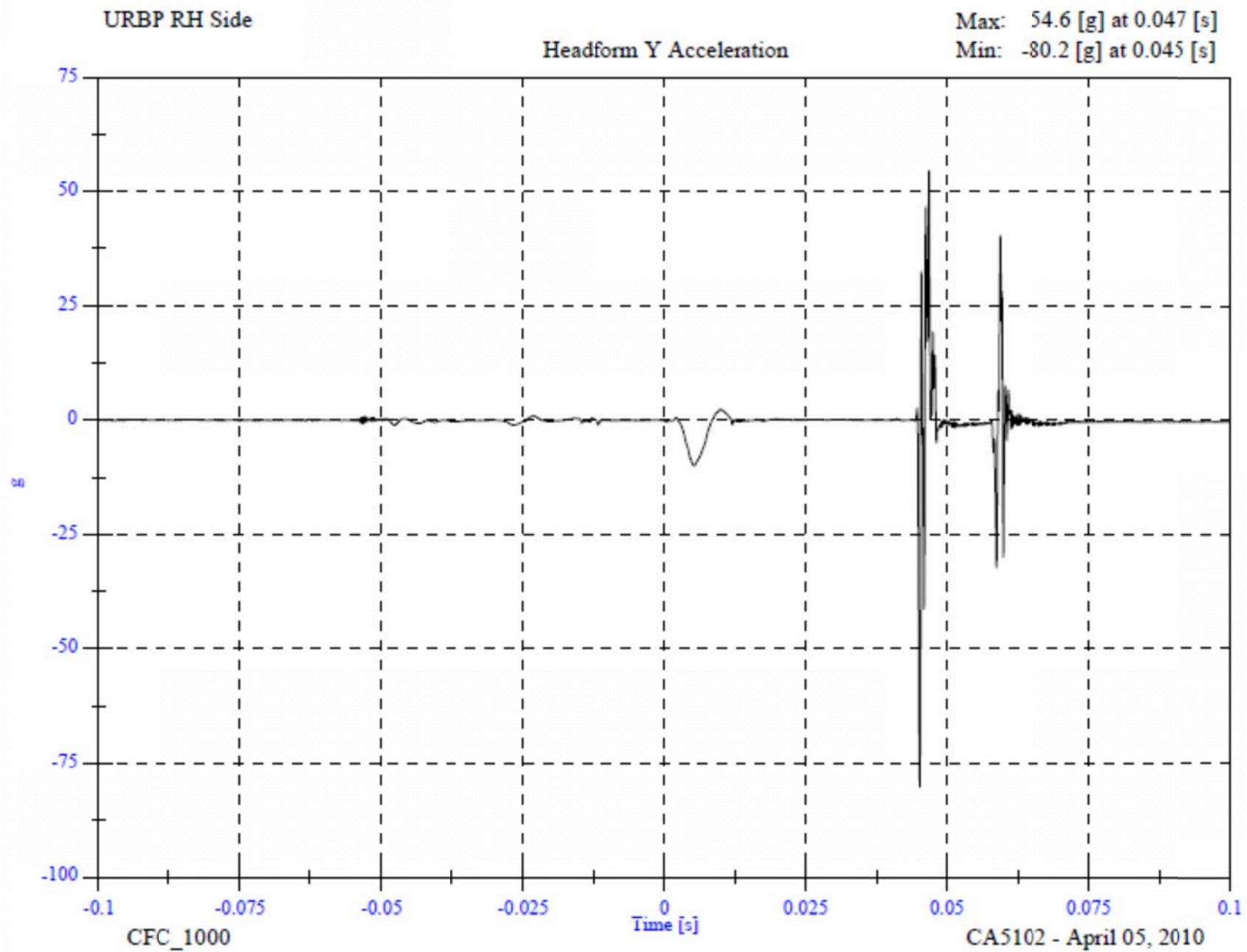
URBP RH Side

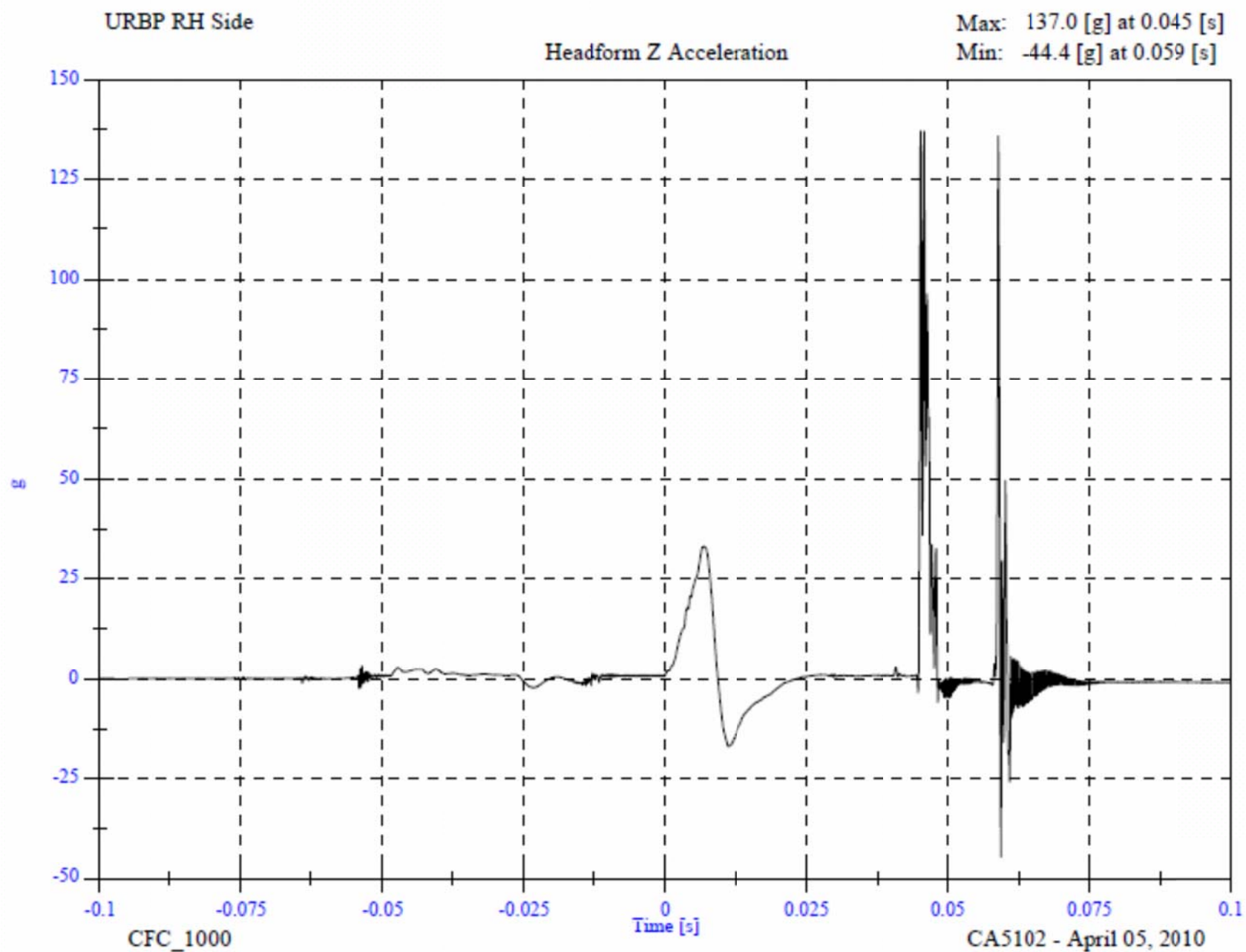
Headform X Acceleration

Max: 269.7 [g] at 0.045 [s]

Min: -110.2 [g] at 0.007 [s]





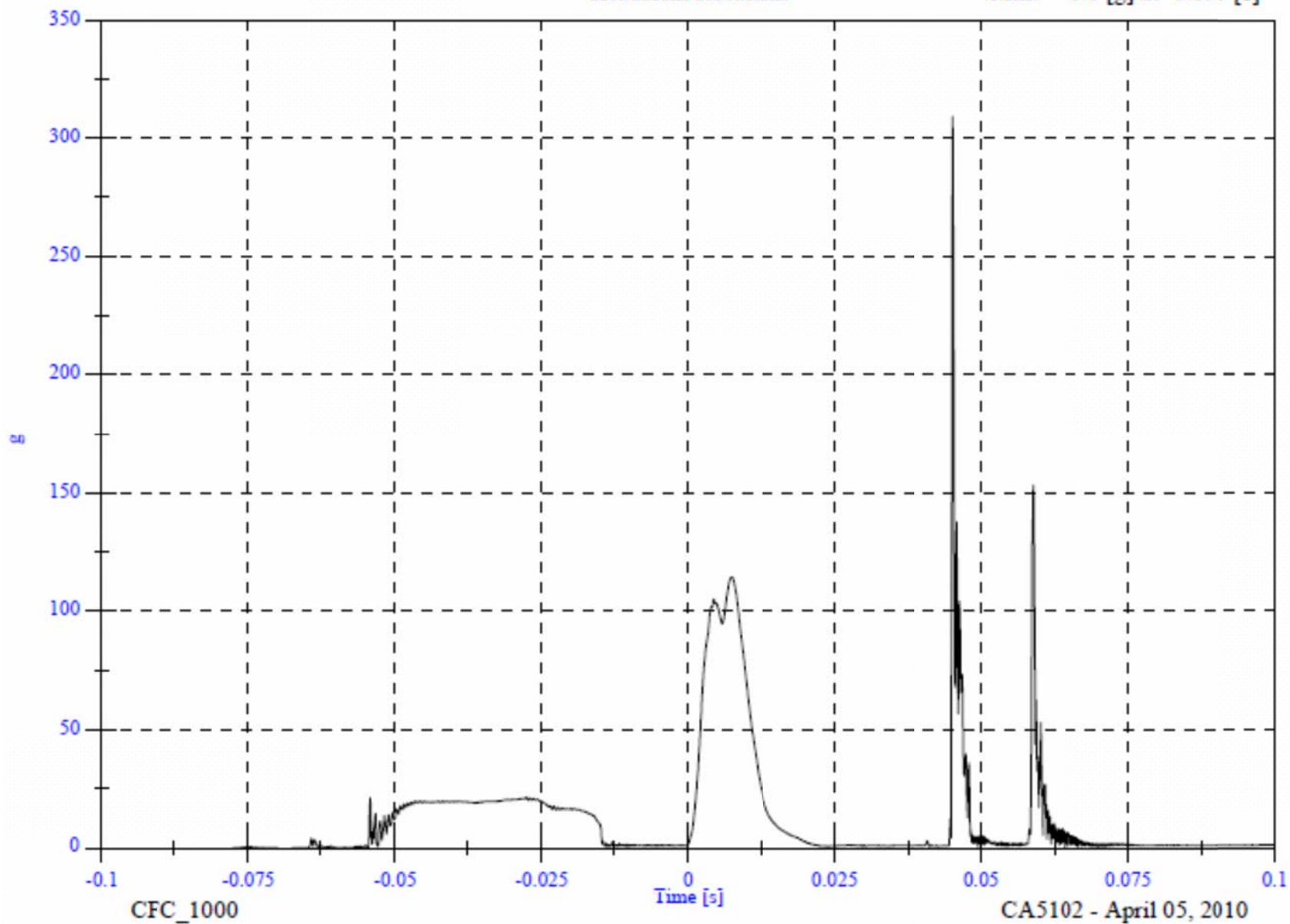


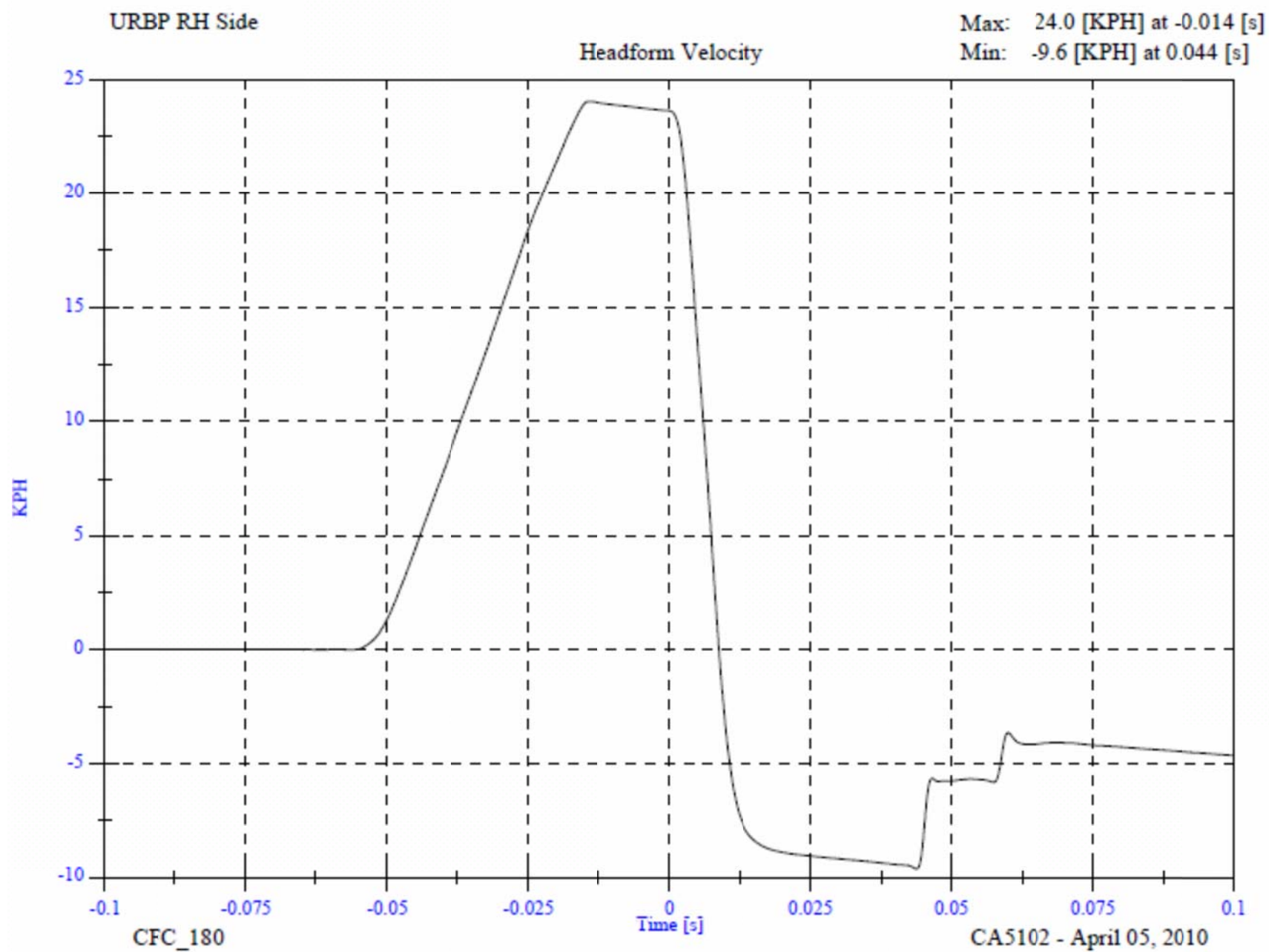
URBP RH Side

Headform Resultant

Max: 309.3 [g] at 0.045 [s]

Min: 0.0 [g] at -0.097 [s]







PRE-IMPACT URBP RH

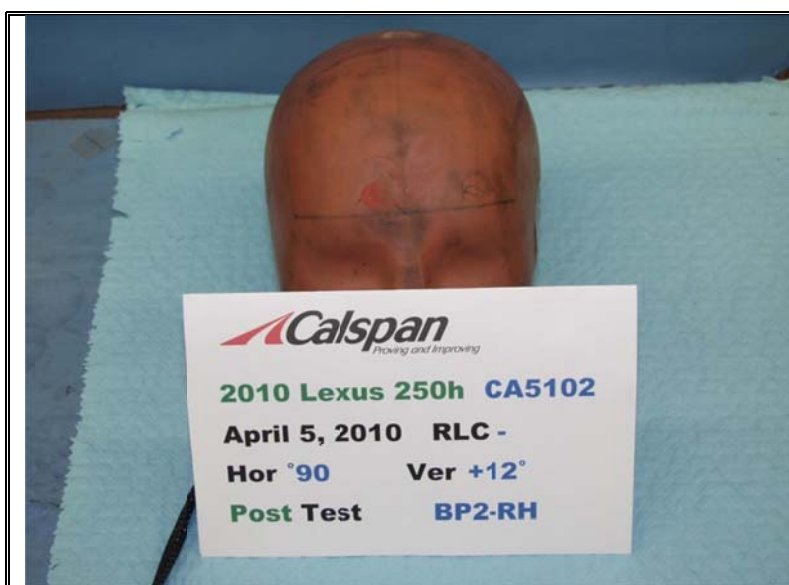


POST-IMPACT URBP RH

VEHICLE YEAR/MAKE/MODEL/STYLE:	2010 Lexus 250h
VIN:	JTHBB1BA5A2014110
DATE OF MANUFACTURE:	11/09 (SEE CERTIFICATION LABEL)
COLOR:	Red

Test Number:	04
Test Date:	5 April 2010
Target Location:	BP2 RH
Target Code:	BP2 RH
Horizontal Impact Angle:	90
Vertical Impact Angle:	12
Ambient Temperature:	21
Relative Humidity:	39.1%
Time of Impact:	4:30
Headform Number:	0062

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	17	<input checked="" type="checkbox"/> mm right	<input type="checkbox"/> mm left
On Centerline	9	mm up	



POST-IMPACT BP2 RH HEADFORM

Free Motion HIC	564.2
HIC(d)	592.1
Impact Velocity (kph)	23.93
HIC T1 (msec)	1.3
HIC T2 (msec)	10.6

BP2 RH Side CA5102 - BP2-RH

FMH Headform 0062

Location: BP2-RH

Test Date: April 05, 2010

Work File: fmh

-----TEST RESULTS-----

Lab Temperature: 21 C

HICd: 592.1

Lab Humidity: 39.1 %

HIC (36ms): 564.2

Velocity at Impact: 23.93 KPH

t1: 1.3 msec

t2: 10.6 msec

Free Flight Distance: 226.60 mm

Duration: 9.3 msec

Maximum: 109.7 g

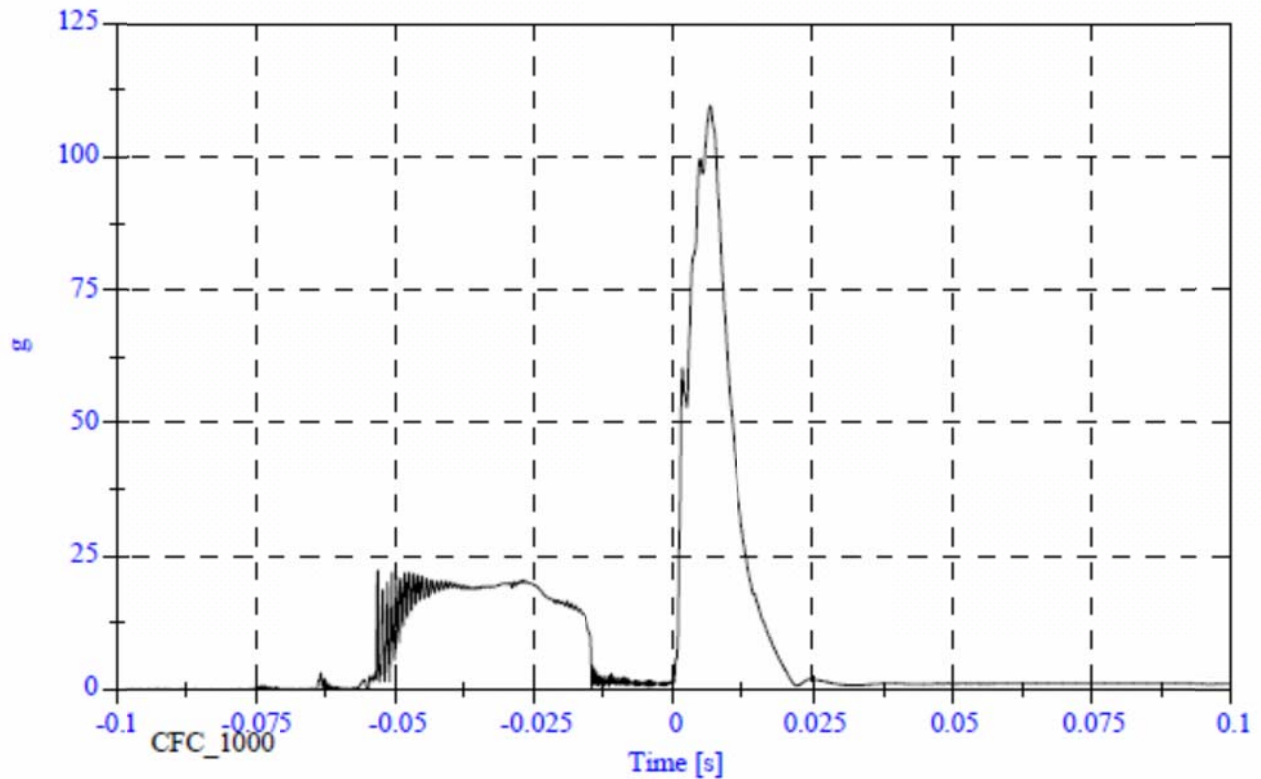
Average Acceleration: 8.8 g

BP2 RH Side

Max: 109.7 [g] at 0.007 [s]

Headform Resultant

Min: 0.0 [g] at -0.082 [s]

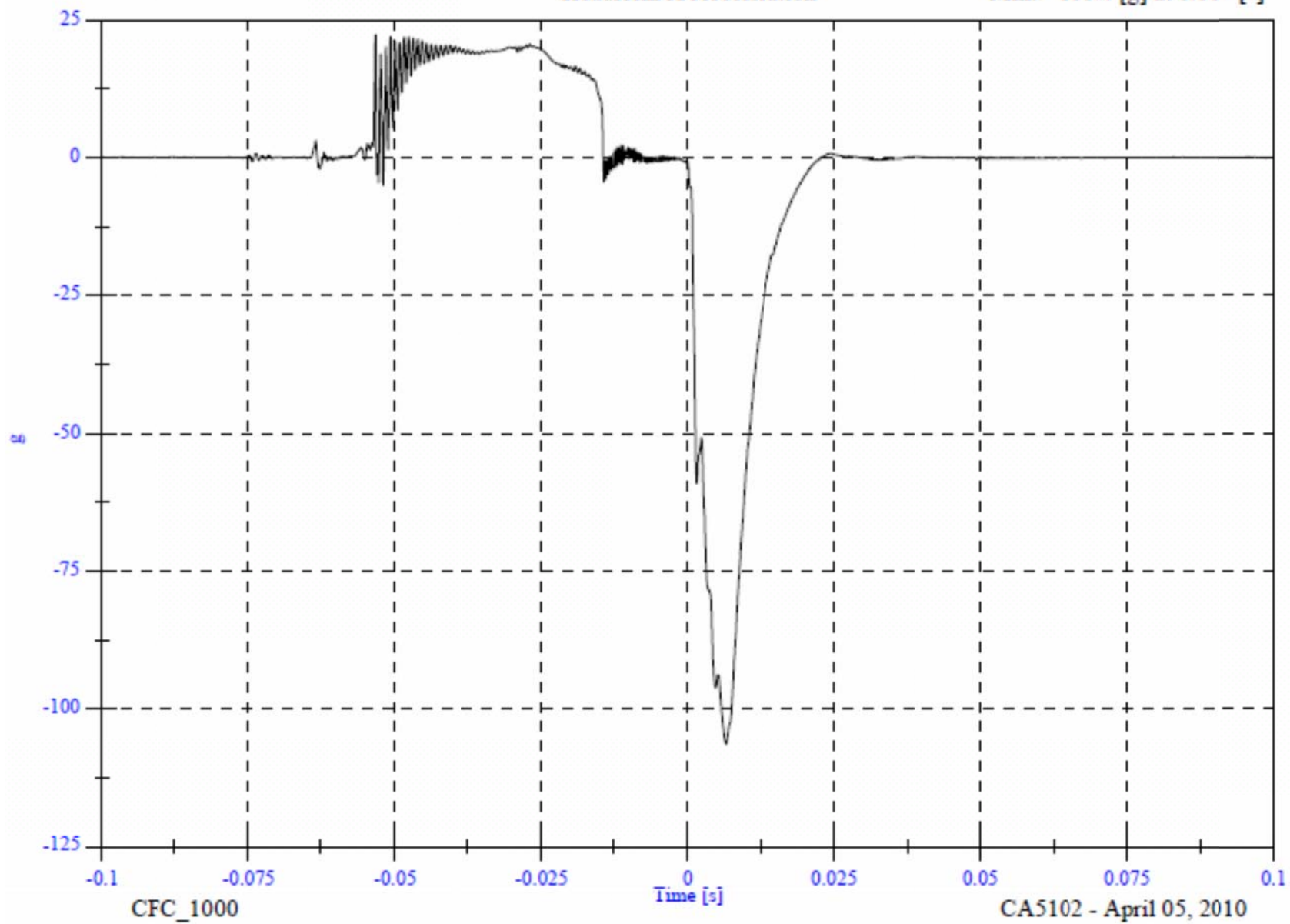


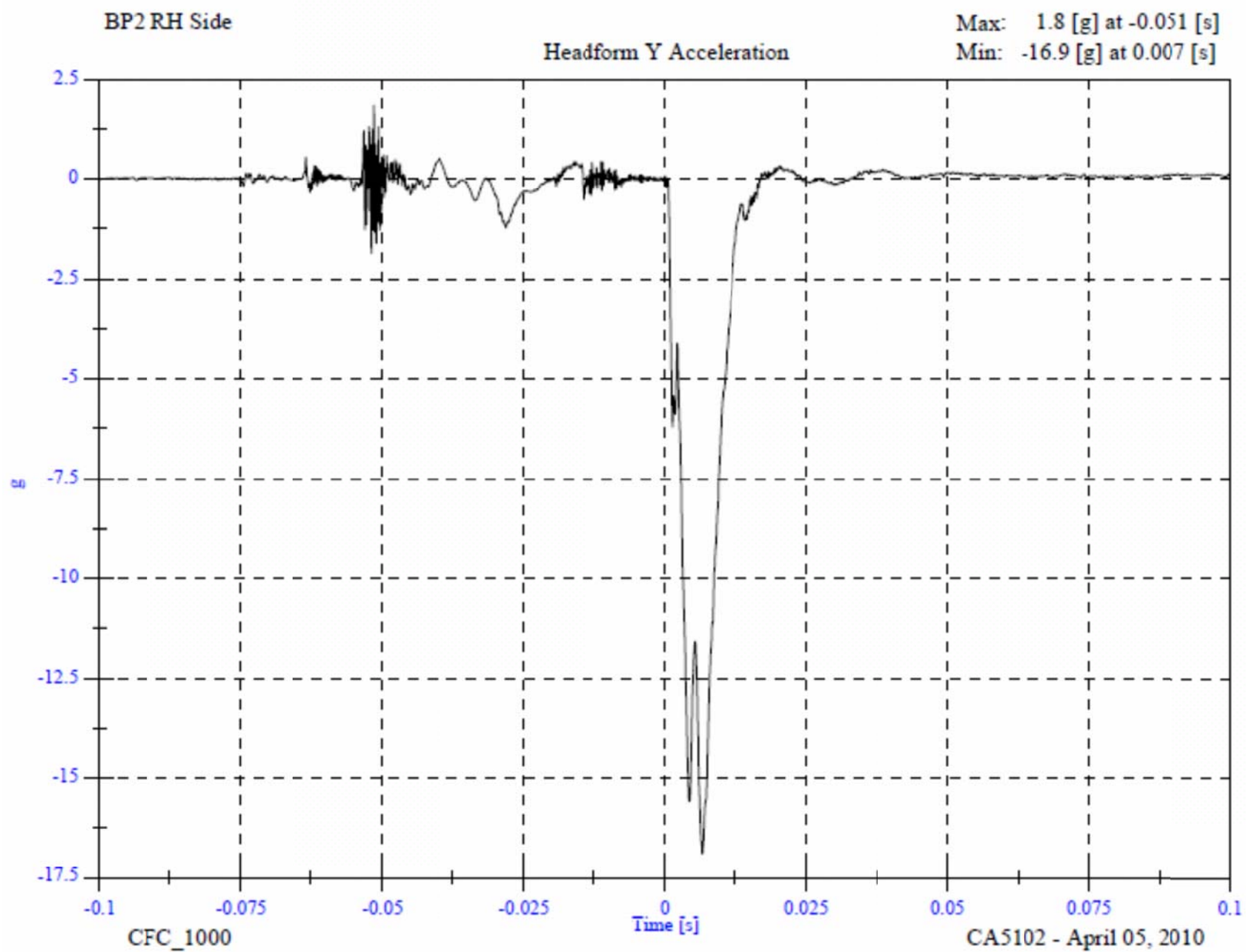
BP2 RH Side

Headform X Acceleration

Max: 22.3 [g] at -0.053 [s]

Min: -106.4 [g] at 0.007 [s]

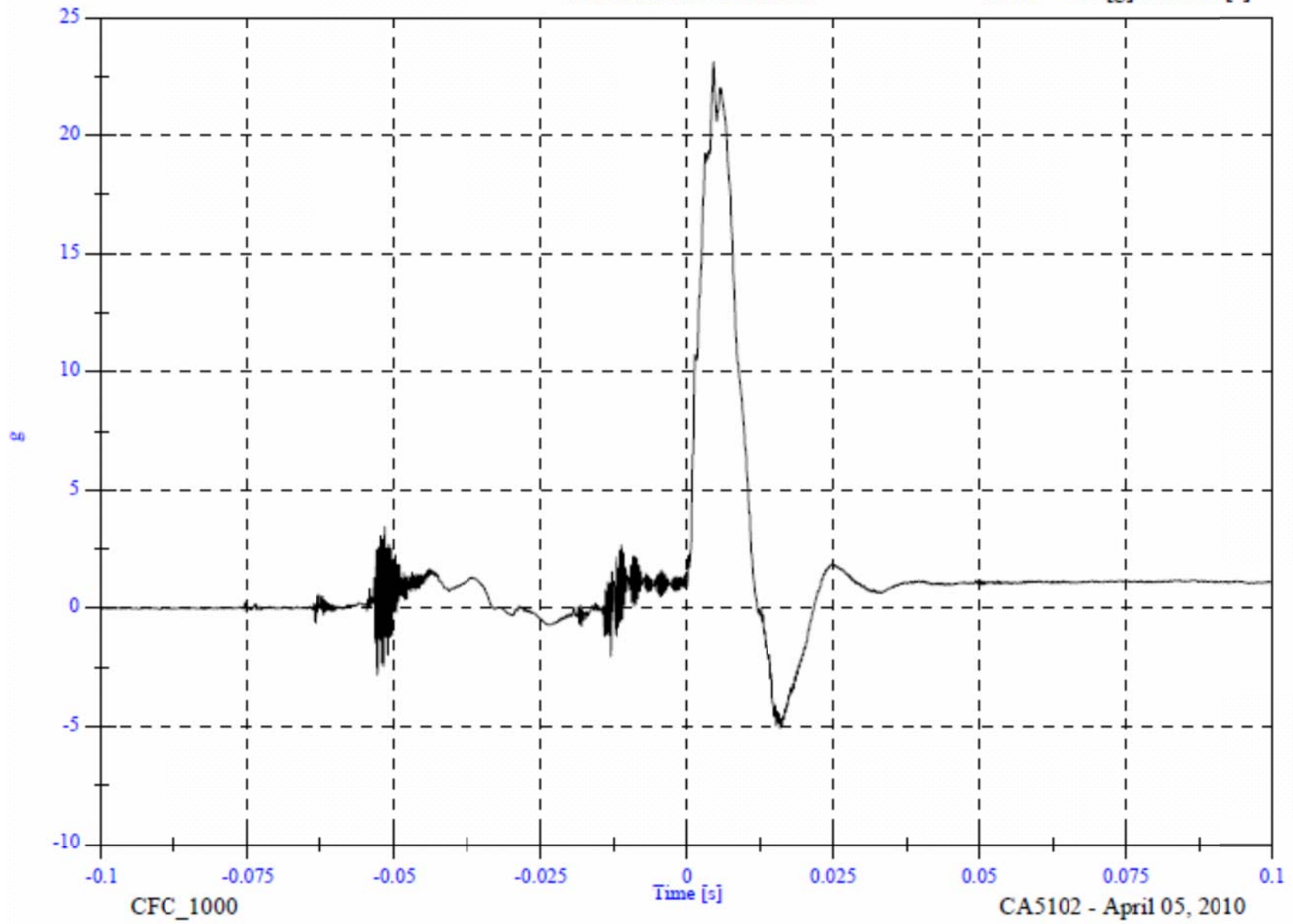




BP2 RH Side

Headform Z Acceleration

Max: 23.1 [g] at 0.005 [s]
Min: -5.1 [g] at 0.016 [s]

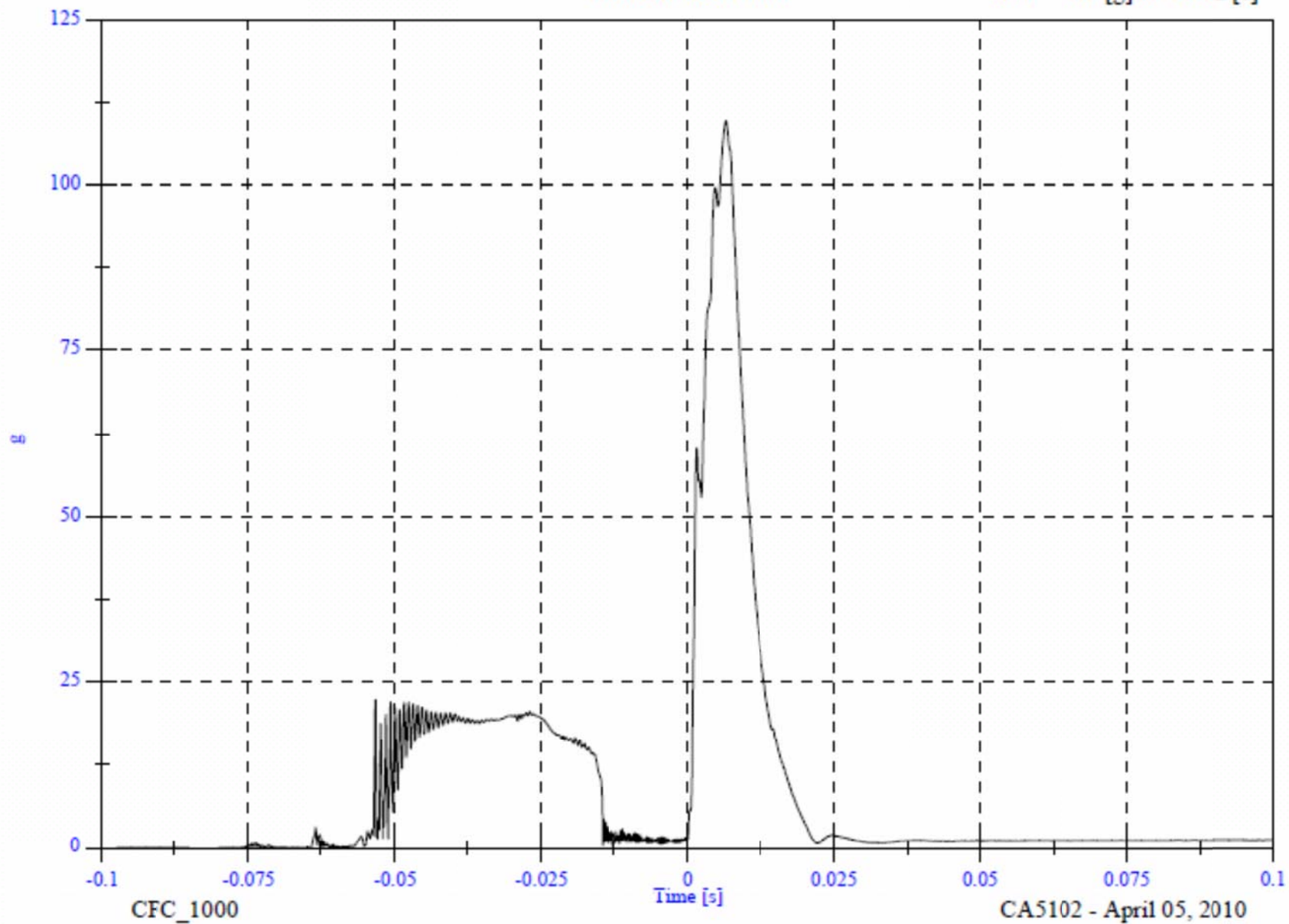


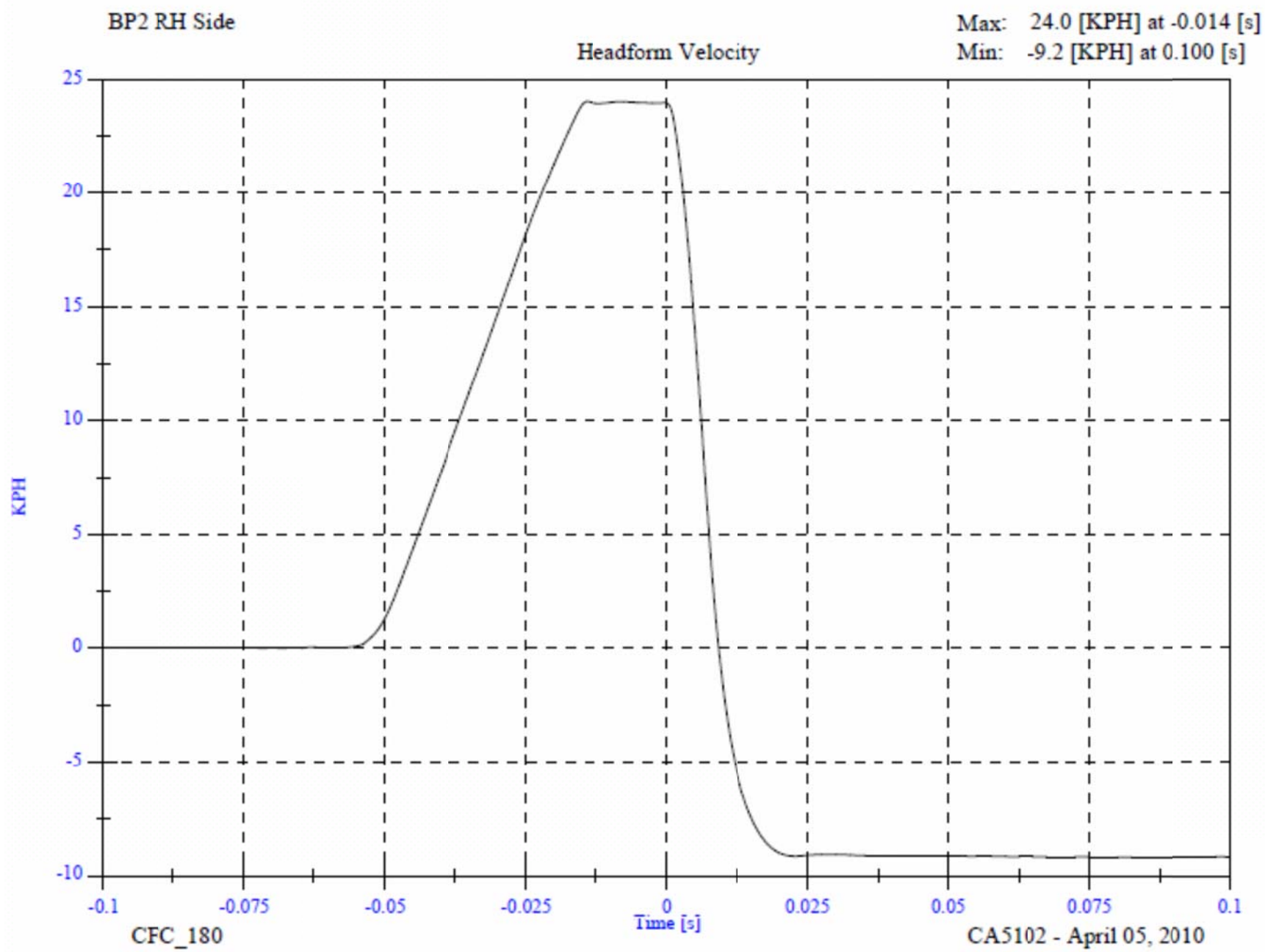
BP2 RH Side

Headform Resultant

Max: 109.7 [g] at 0.007 [s]

Min: 0.0 [g] at -0.082 [s]







PRE-IMPACT BP2 RH

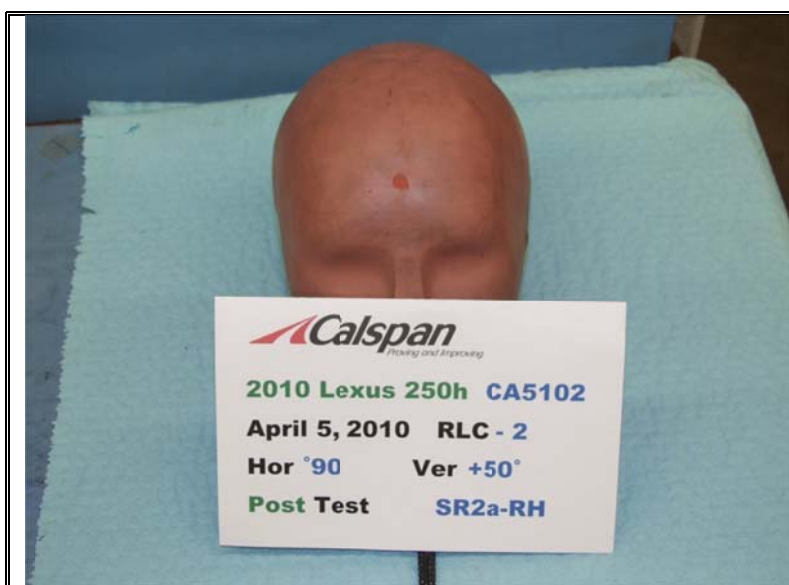


POST-IMPACT BP2 RH

VEHICLE YEAR/MAKE/MODEL/STYLE:	2010 Lexus 250h
VIN:	JTHBB1BA5A2014110
DATE OF MANUFACTURE:	11/09 (SEE CERTIFICATION LABEL)
COLOR:	Red

Test Number:	05
Test Date:	5 April 2010
Target Location:	SR2A RH
Target Code:	SR2A RH
Horizontal Impact Angle:	90
Vertical Impact Angle:	50
Ambient Temperature:	21
Relative Humidity:	40.1%
Time of Impact:	5:02
Headform Number:	1140

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	-1	<input type="checkbox"/> mm right	<input checked="" type="checkbox"/> mm left
On Centerline	16	mm up	



POST-IMPACT SR2A RH HEADFORM

Free Motion HIC	360.7
HIC(d)	438.5
Impact Velocity (kph)	18.31
HIC T1 (msec)	11.5
HIC T2 (msec)	17.3

SR2a RH Side CA5102 - SR2a-RH

FMH Headform 1140

Location: SR2a-RH

Test Date: April 05, 2010

Work File: fmh

-----TEST RESULTS-----

Lab Temperature: 21 C

HICd: 438.5

Lab Humidity: 40.1 %

HIC (36ms): 360.7

Velocity at Impact: 18.31 KPH

t1: 11.5 msec

t2: 17.3 msec

Free Flight Distance: 223.90 mm

Duration: 5.8 msec

Maximum: 110.6 g

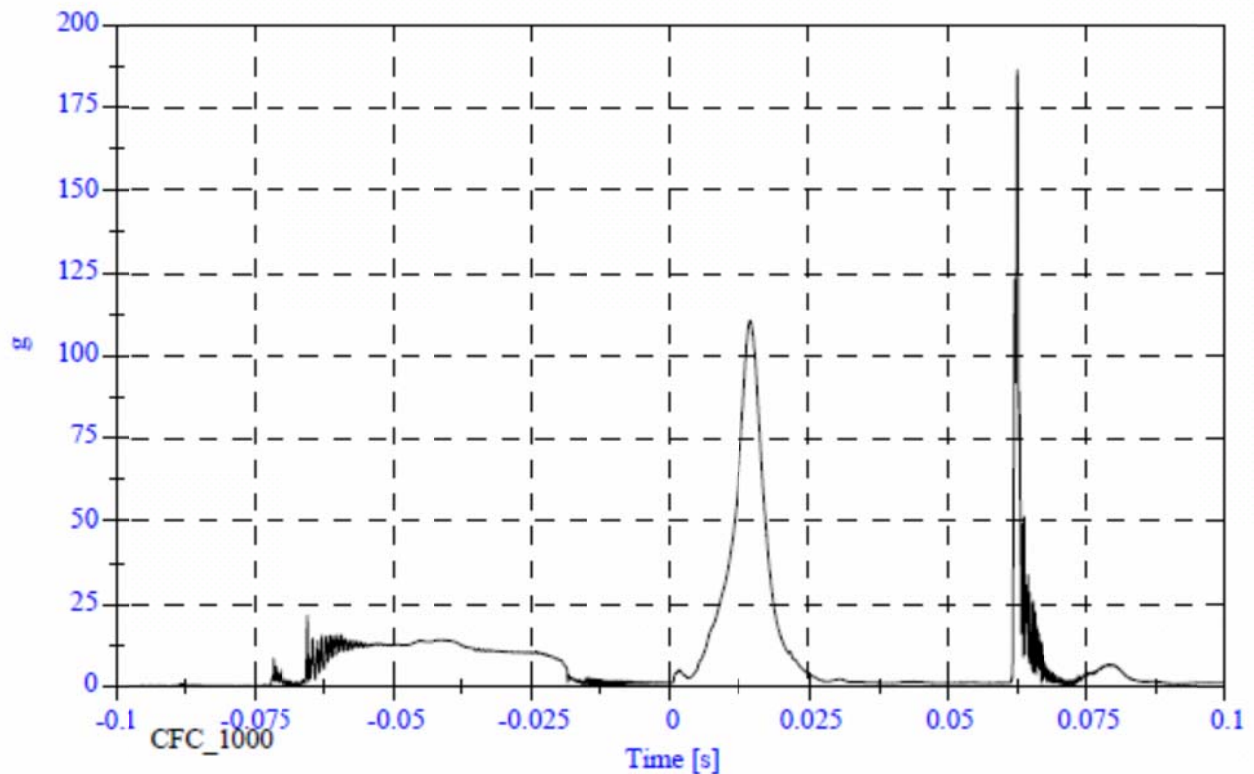
Average Acceleration: 8.4 g

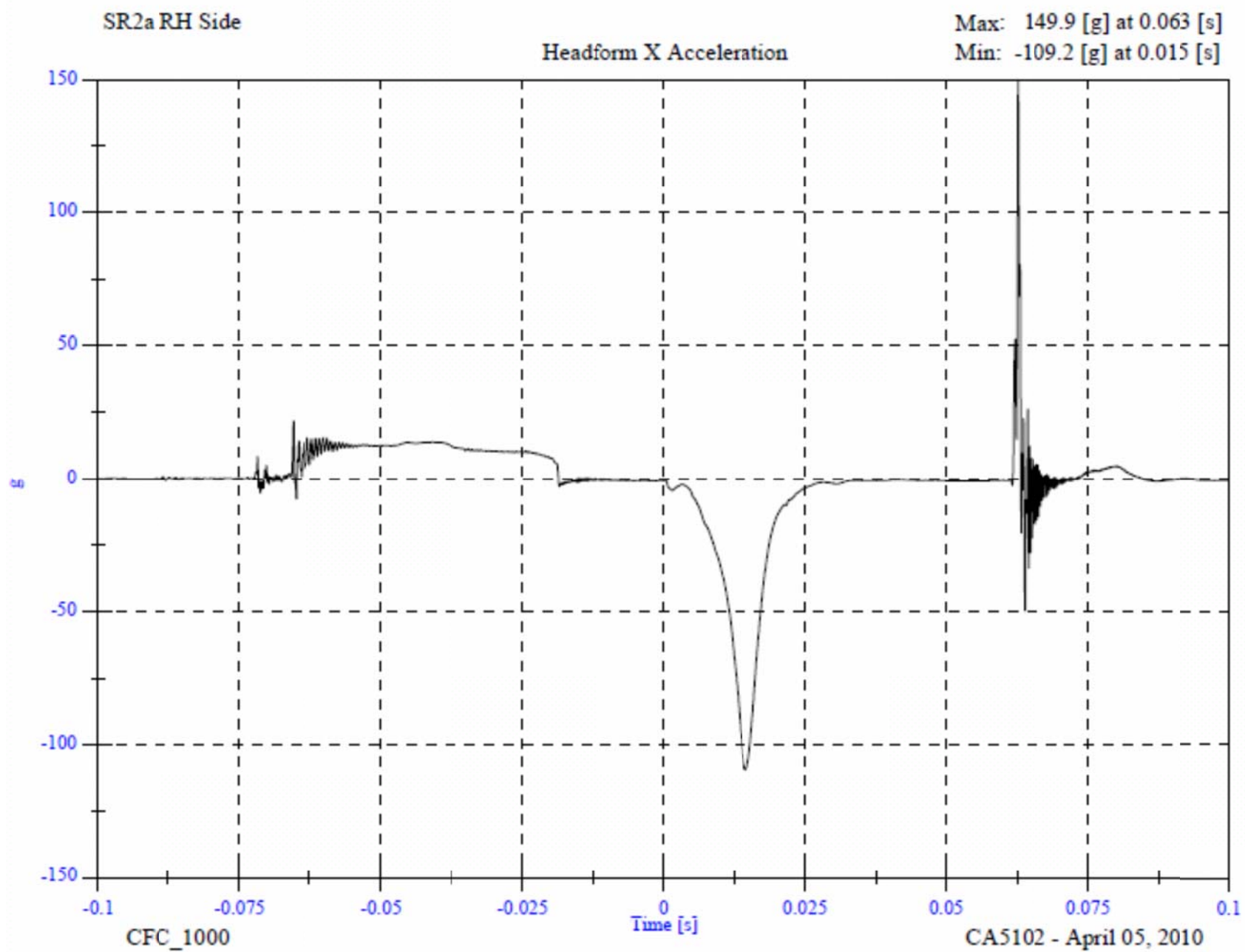
SR2a RH Side

Headform Resultant

Max: 110.6 [g] at 0.015 [s]

Min: 0.0 [g] at -0.079 [s]



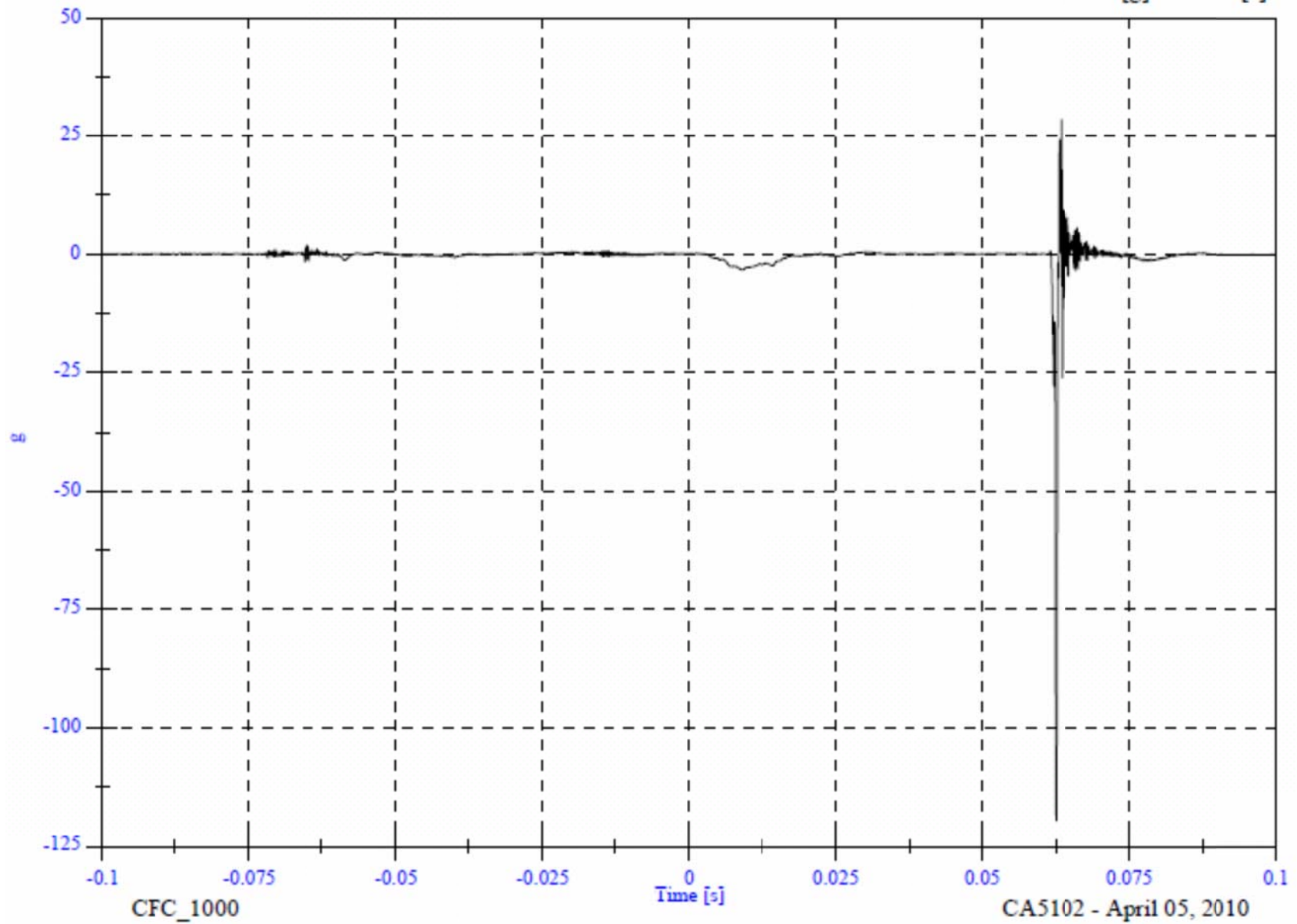


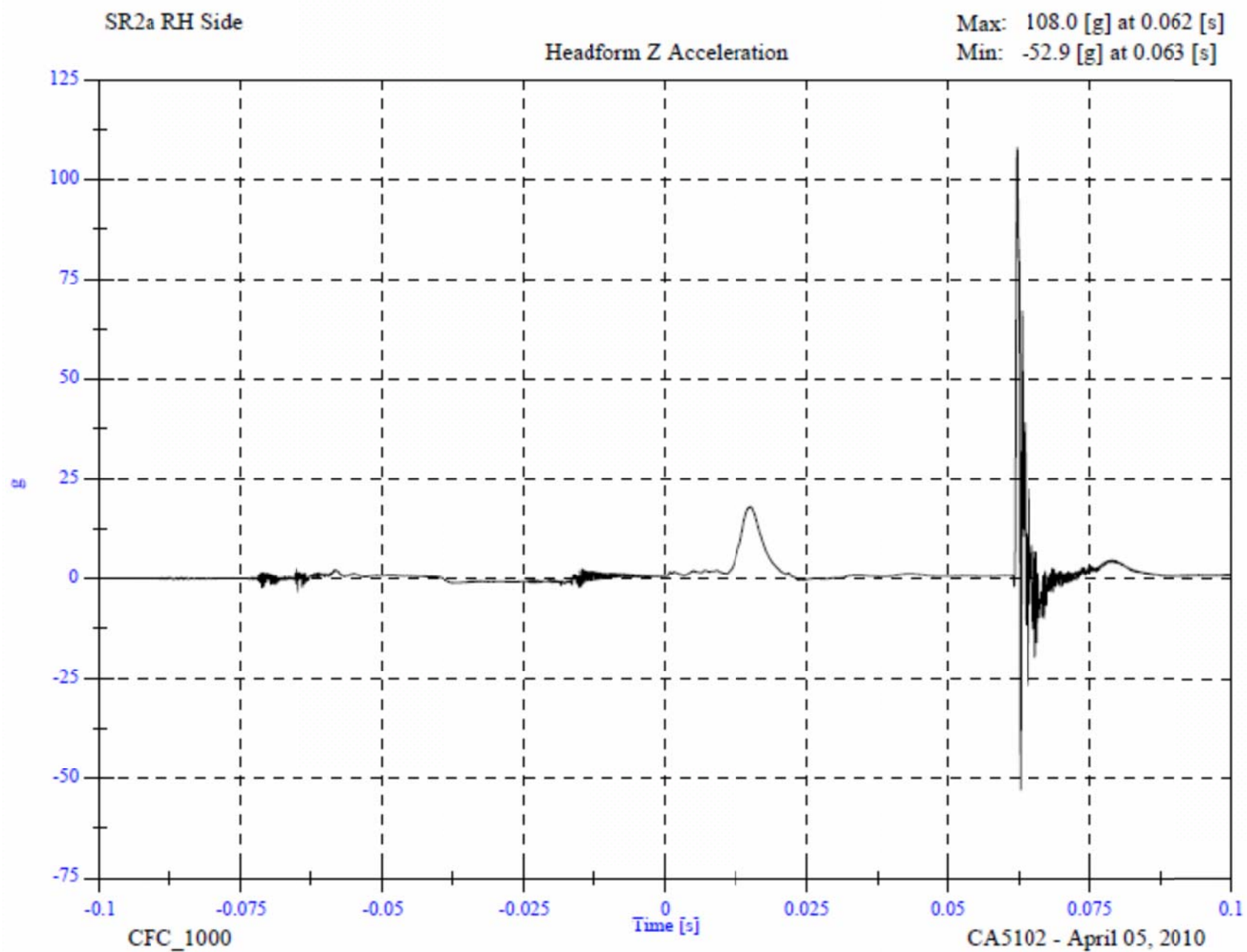
SR2a RH Side

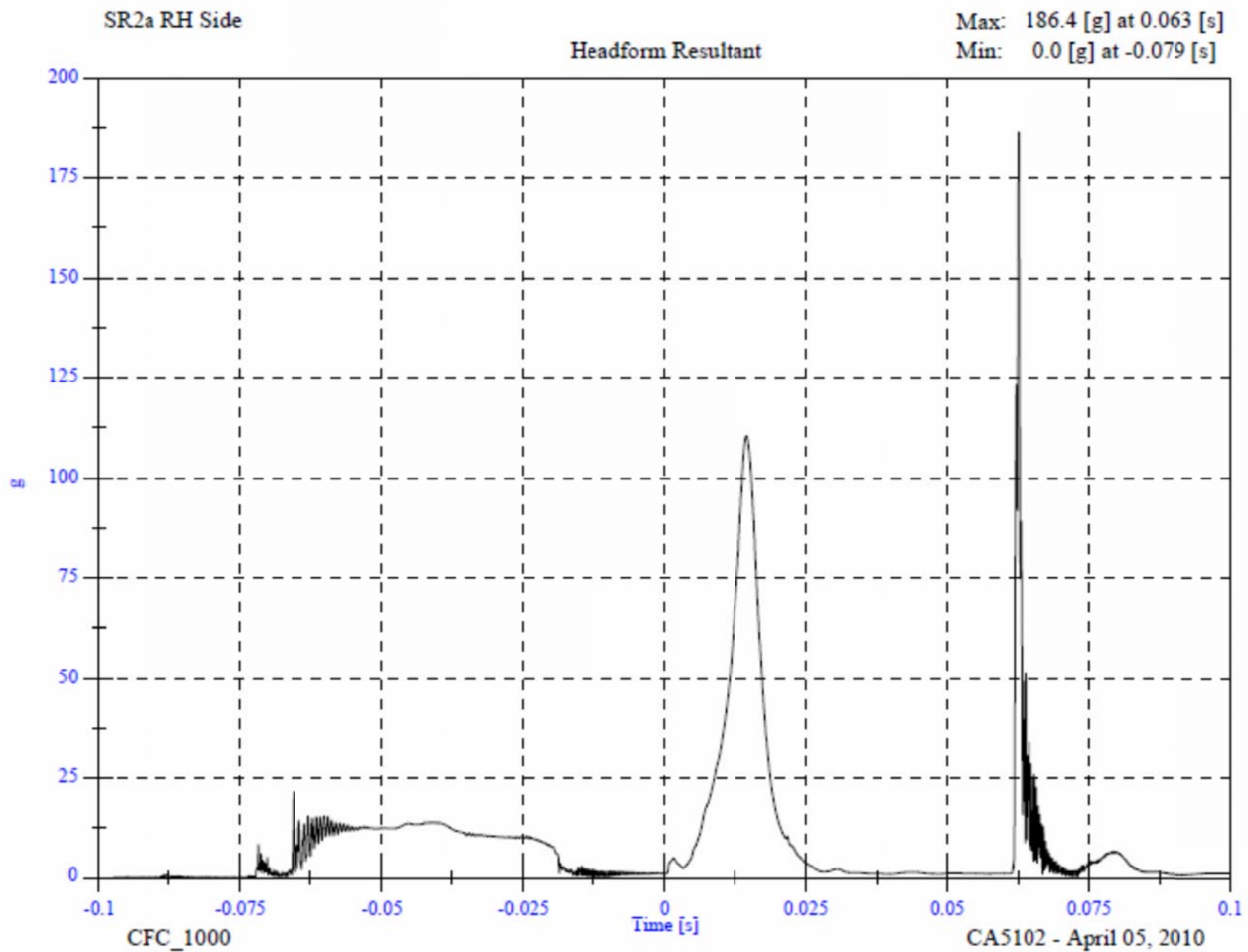
Headform Y Acceleration

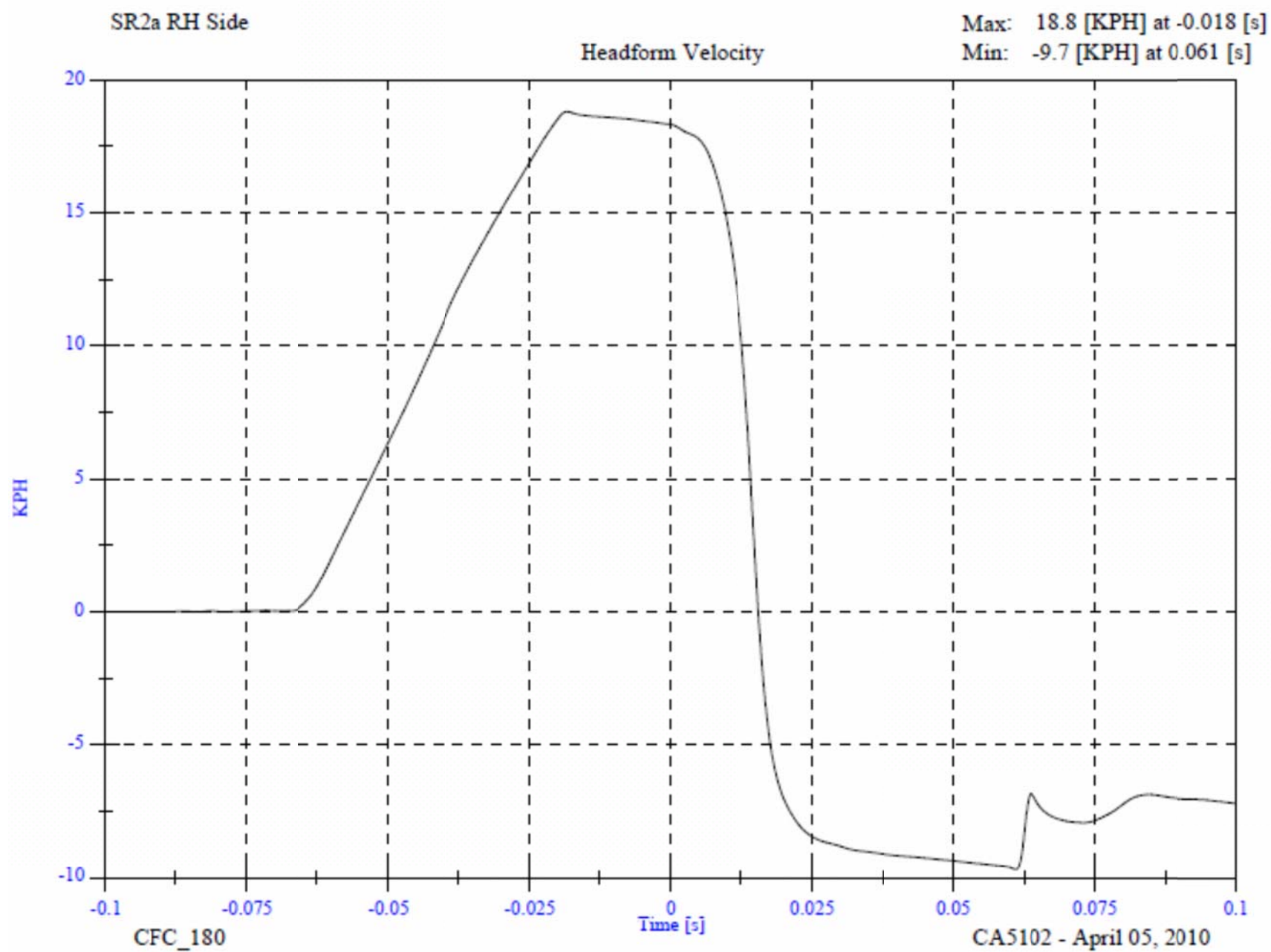
Max: 28.5 [g] at 0.063 [s]

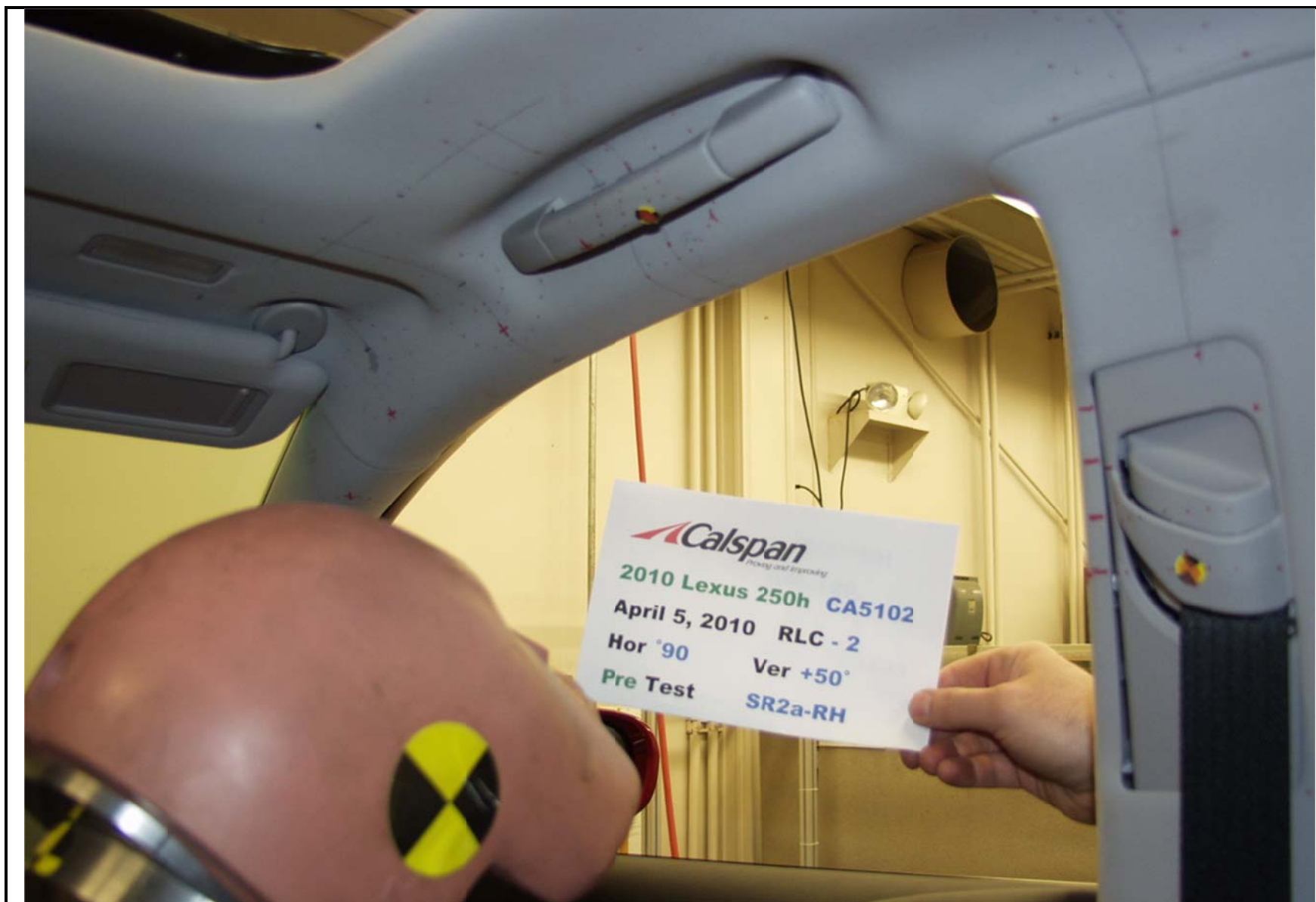
Min: -119.5 [g] at 0.062 [s]



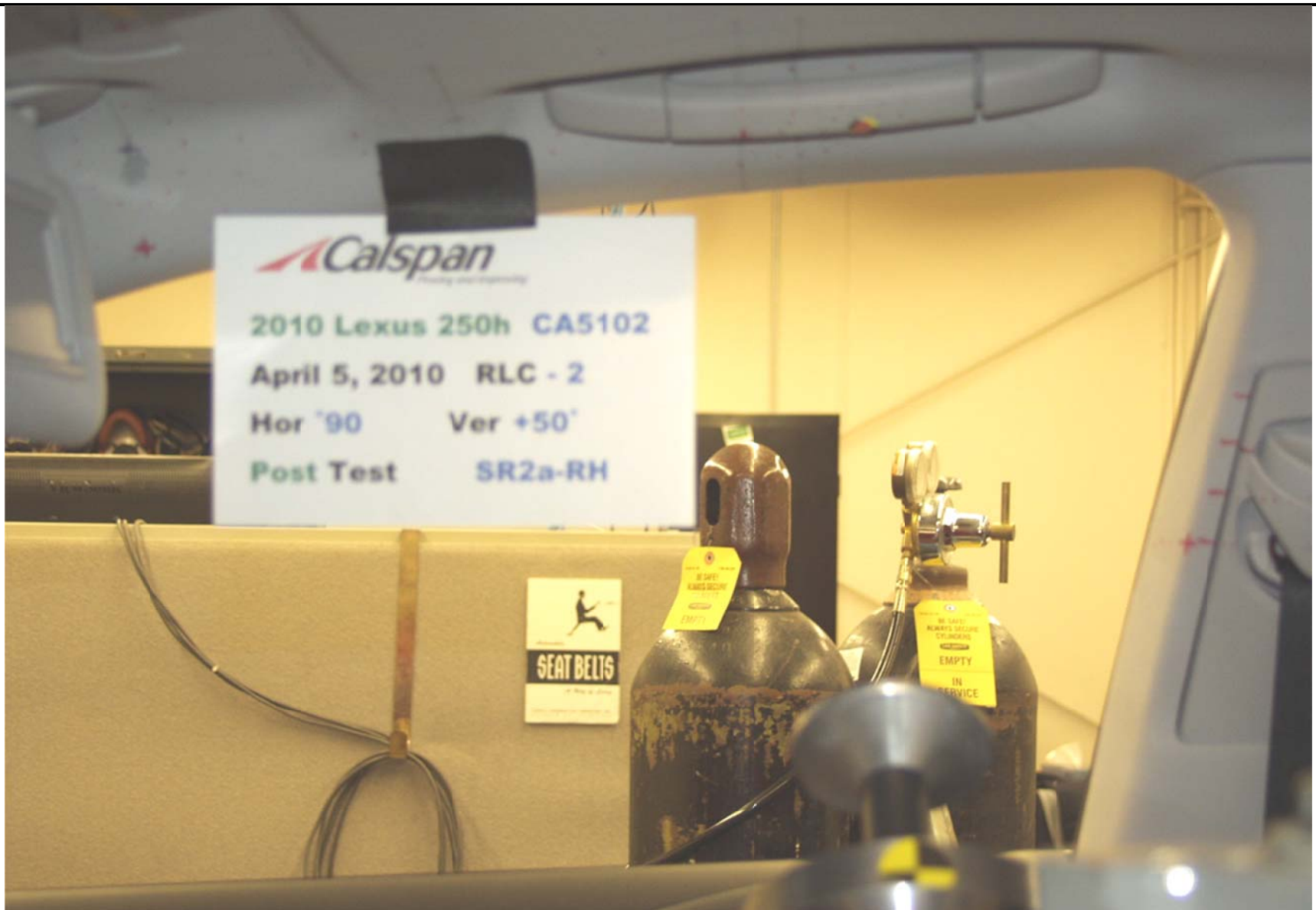








PRE-IMPACT SR2A RH

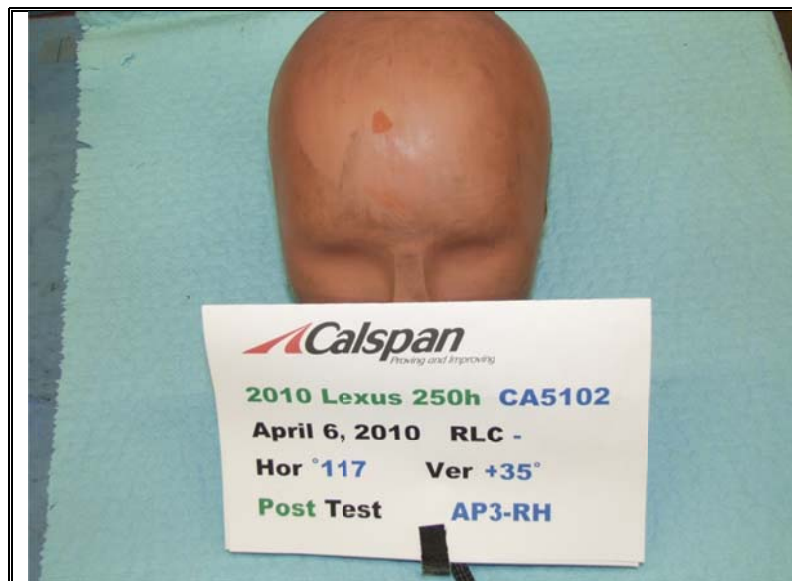


POST-IMPACT SR2A RH

VEHICLE YEAR/MAKE/MODEL/STYLE:	2010 Lexus 250h
VIN:	JTHBB1BA5A2014110
DATE OF MANUFACTURE:	11/09 (SEE CERTIFICATION LABEL)
COLOR:	Red

Test Number:	06
Test Date:	6 April 2010
Target Location:	AP3 RH
Target Code:	AP3 RH
Horizontal Impact Angle:	117
Vertical Impact Angle:	35
Ambient Temperature:	20
Relative Humidity:	41.0%
Time of Impact:	9:34
Headform Number:	1140

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	7	<input checked="" type="checkbox"/> mm right	<input type="checkbox"/> mm left
On Centerline	39	mm up	



POST-IMPACT AP3 RH HEADFORM

Free Motion HIC	328.3
HIC(d)	414.1
Impact Velocity (kph)	18.49
HIC T1 (msec)	61.7
HIC T2 (msec)	62.2

AP3 RH Side CA5102 - AP3-RH

FMH Headform 1140

Location: AP3-RH

Test Date: April 06, 2010

Work File: fmh

-----TEST RESULTS-----

Lab Temperature: 20 C

HICd: 414.1

Lab Humidity: 41.0 %

HIC (36ms): 328.3

Velocity at Impact: 18.49 KPH

t1: 5.9 msec

t2: 13.2 msec

Free Flight Distance: 229.31 mm

Duration: 7.3 msec

Maximum: 107.5 g

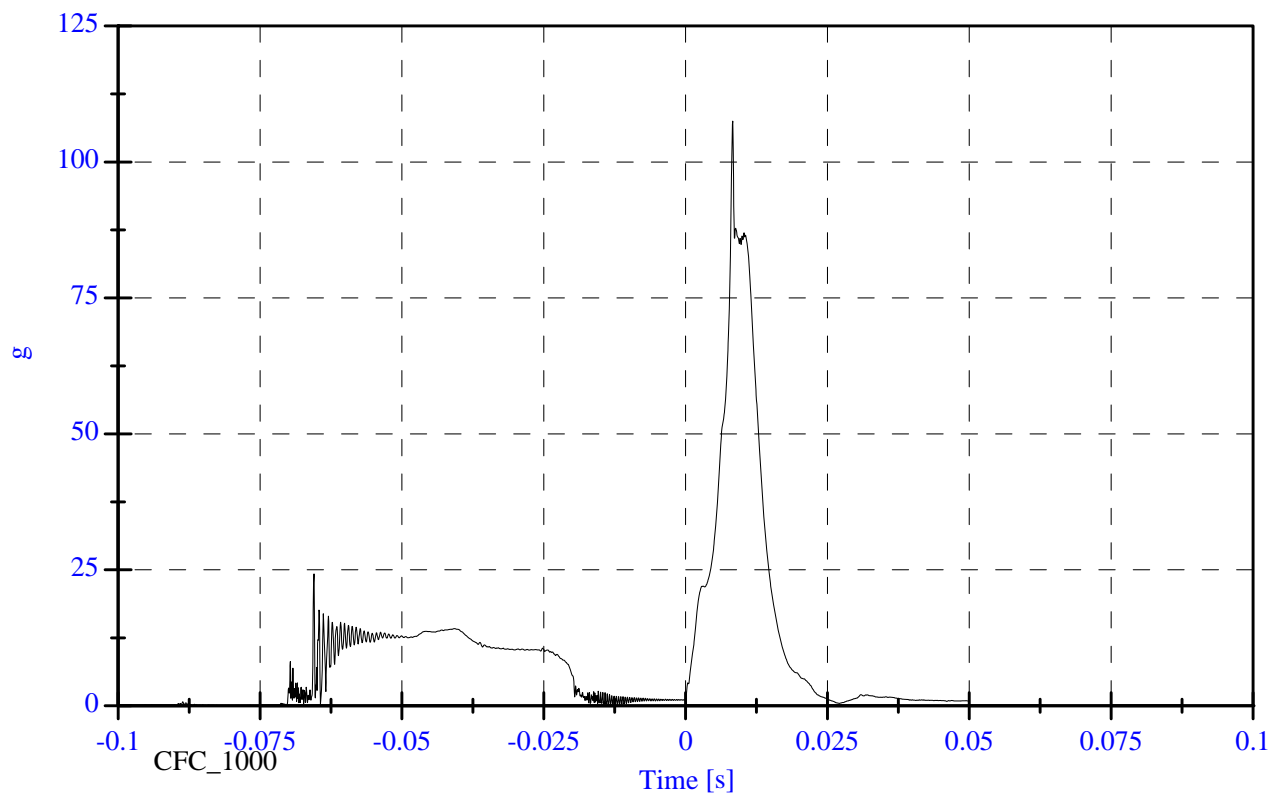
Average Acceleration: 9.2 g

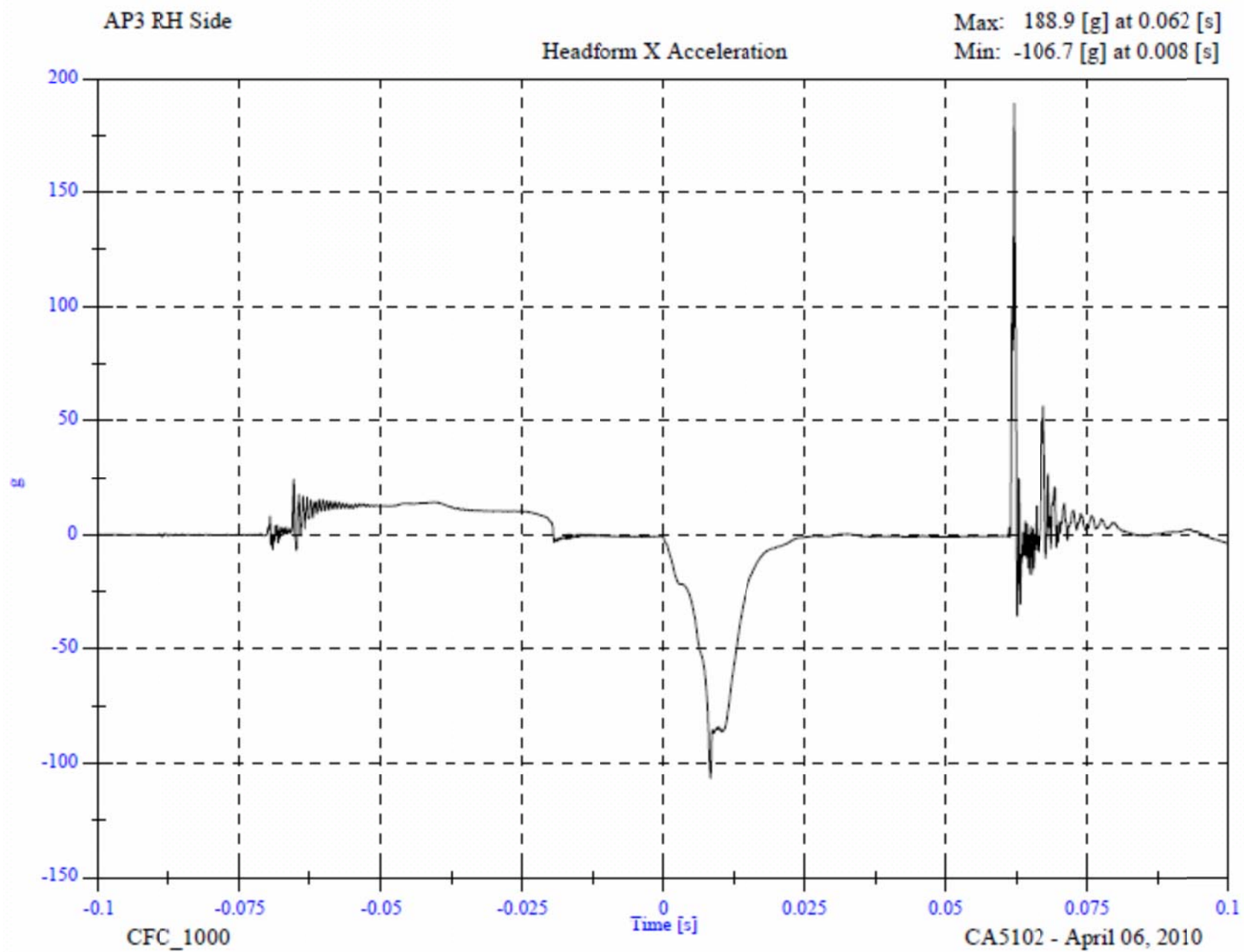
AP3 RH Side

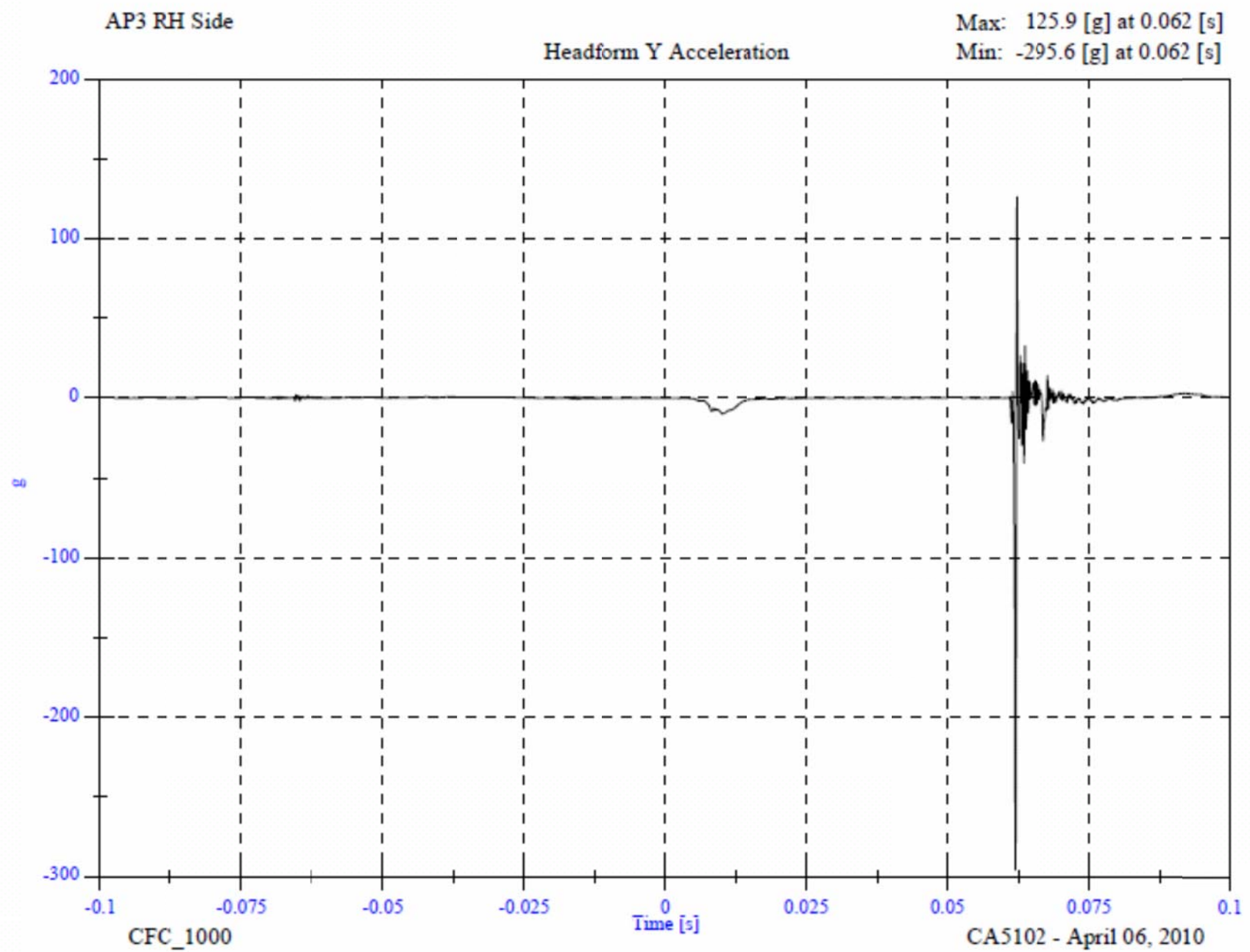
Headform Resultant

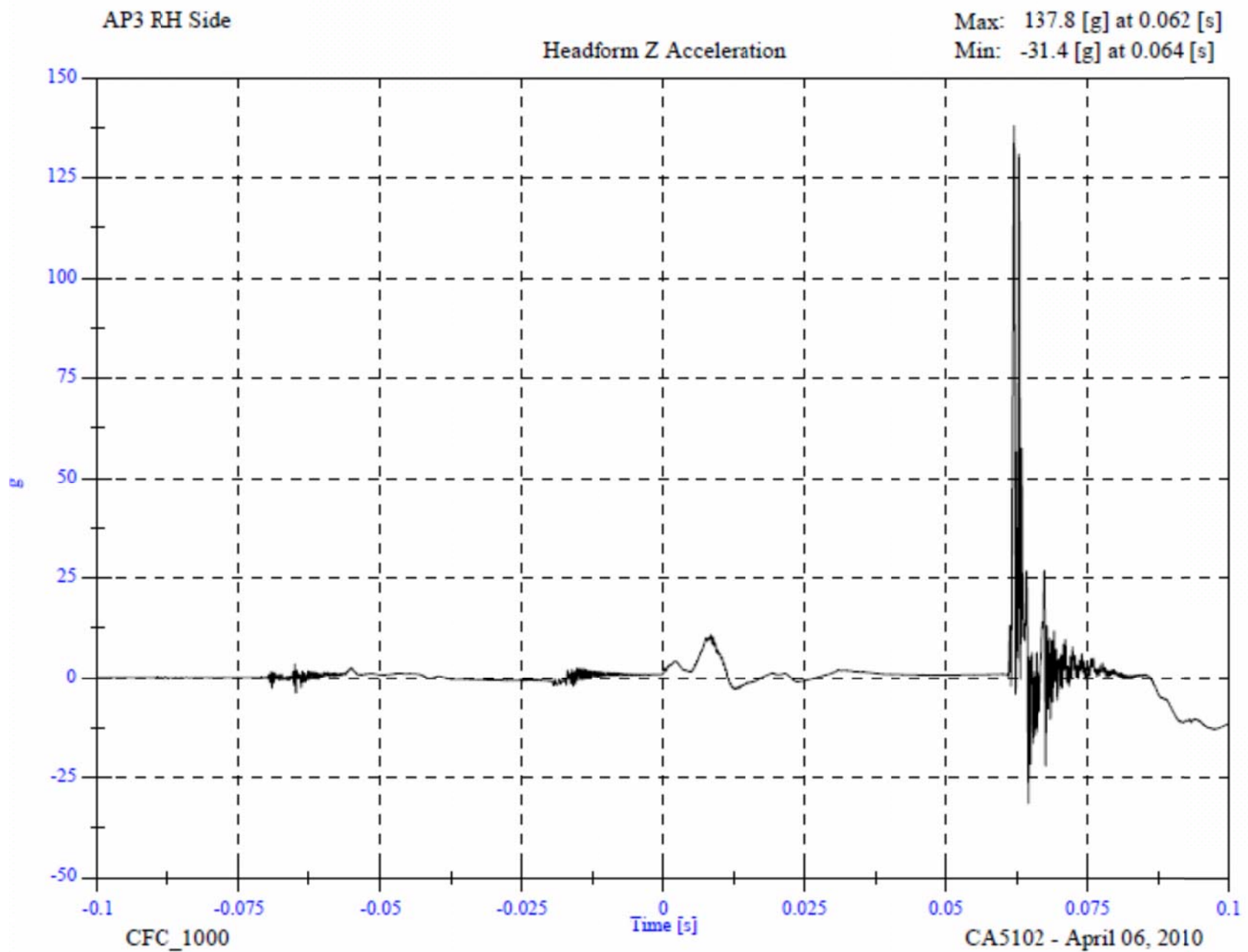
Max: 107.5 [g] at 0.008 [s]

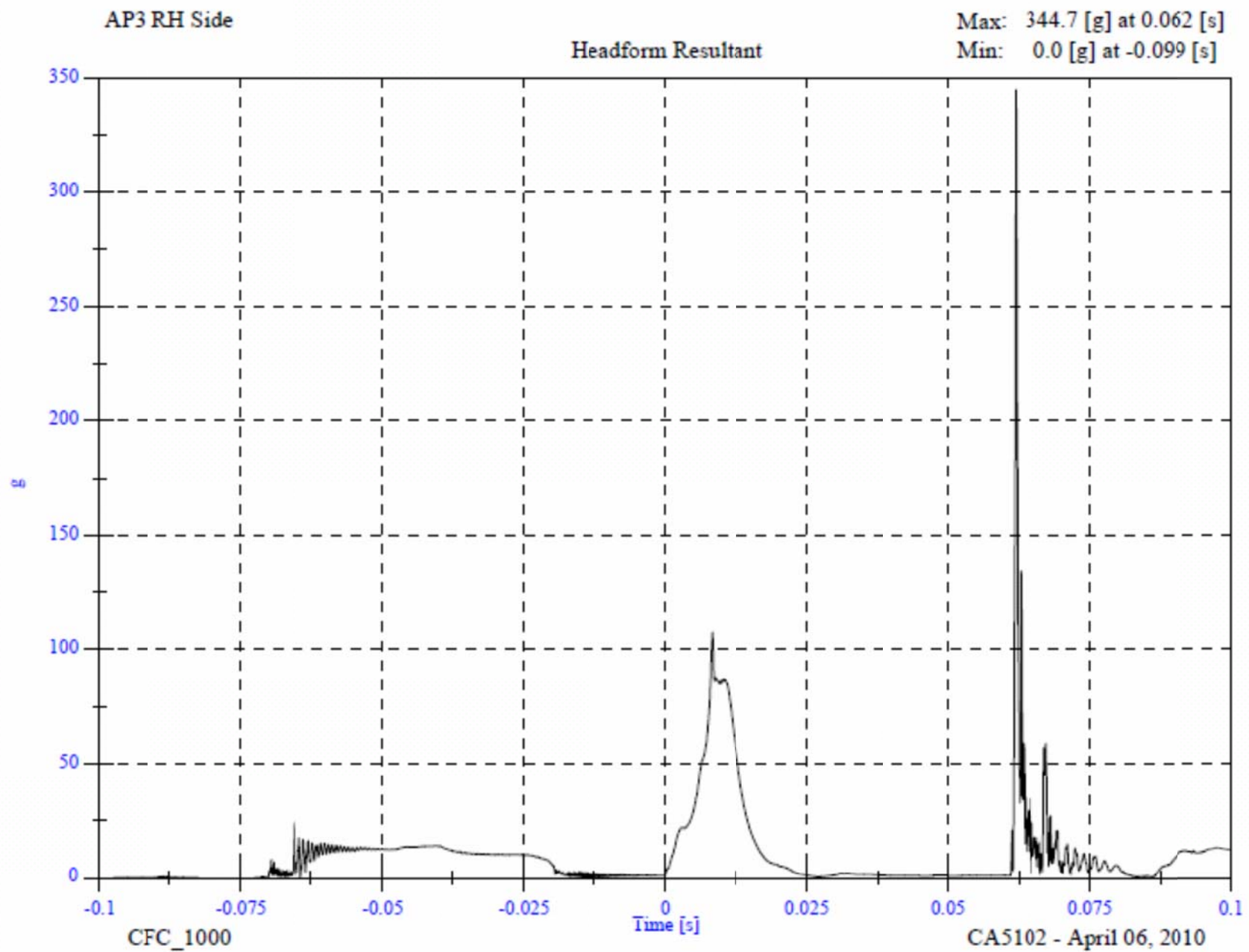
Min: 0.0 [g] at -0.099 [s]

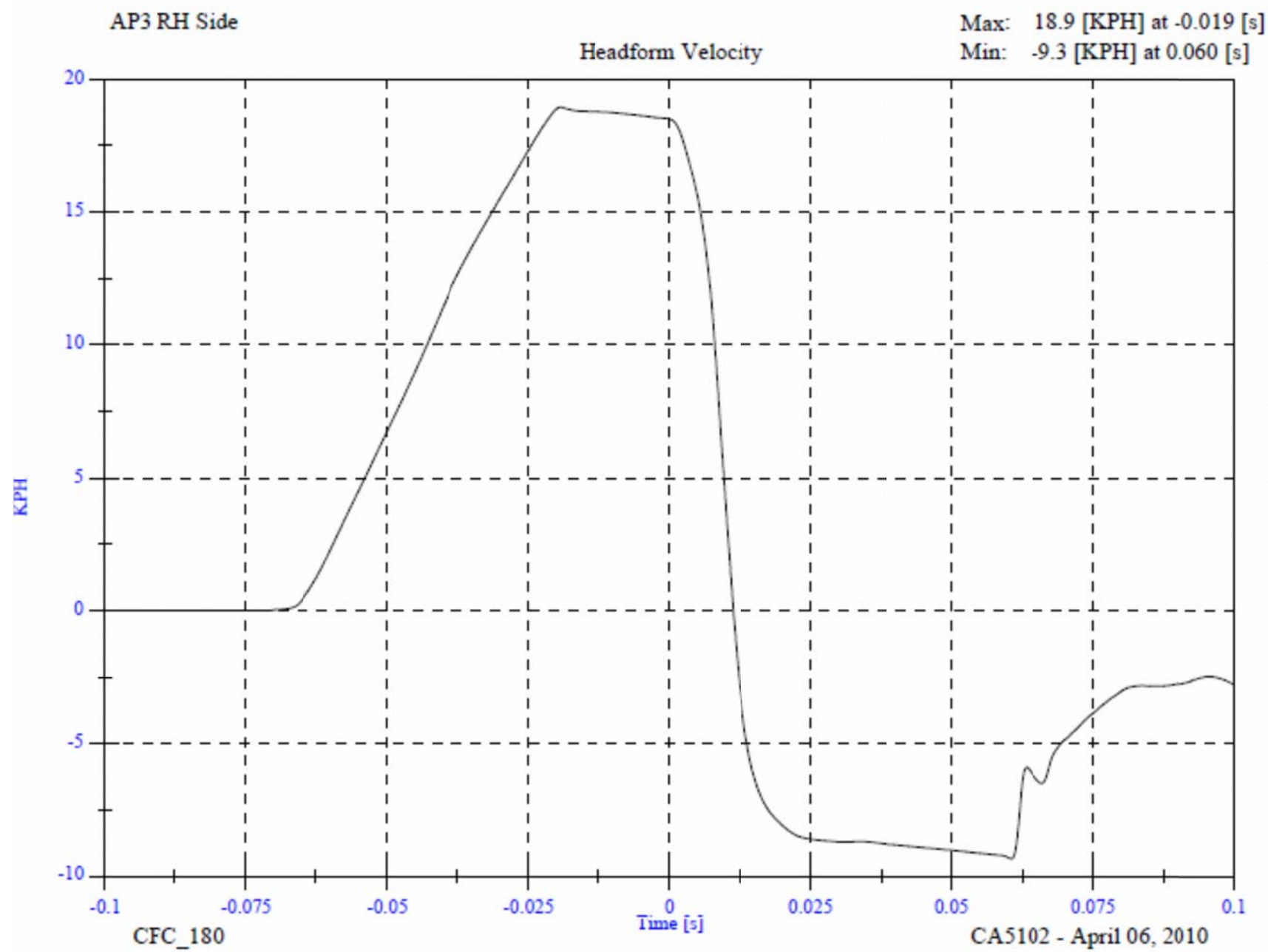






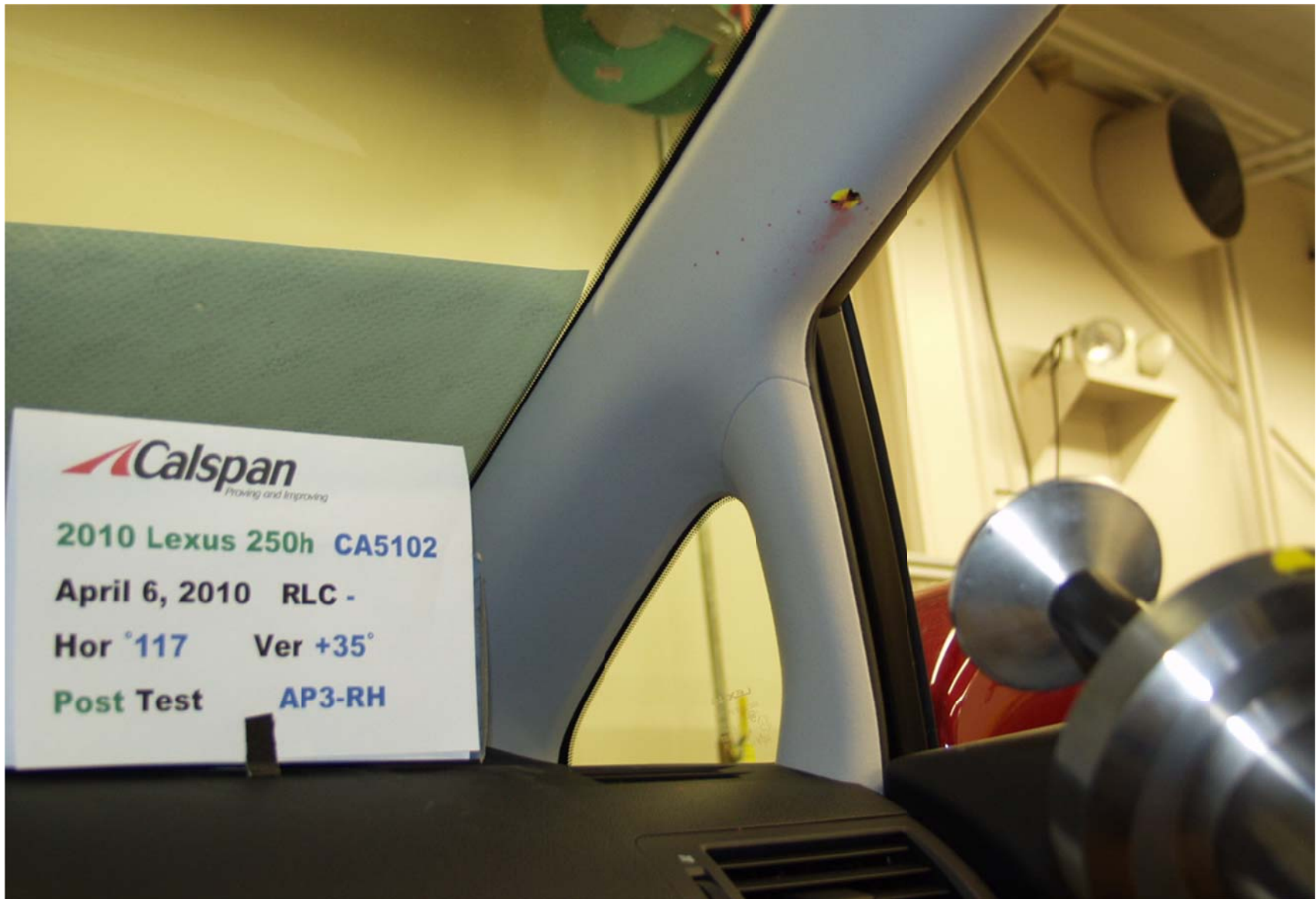








PRE-IMPACT AP3 RH



POST-IMPACT AP3 RH

VEHICLE YEAR/MAKE/MODEL/STYLE:	2010 Lexus 250h
VIN:	JTHBB1BA5A2014110
DATE OF MANUFACTURE:	11/09 (SEE CERTIFICATION LABEL)
COLOR:	Red

Test Number:	07
Test Date:	6 April 2010
Target Location:	AP1 RH
Target Code:	AP1 RH
Horizontal Impact Angle:	120
Vertical Impact Angle:	20
Ambient Temperature:	20
Relative Humidity:	43.4%
Time of Impact:	10:50
Headform Number:	0062

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	33	<input checked="" type="checkbox"/> mm right	<input type="checkbox"/> mm left
On Centerline	7	mm up	



POST-IMPACT AP1 RH HEADFORM

Free Motion HIC	163.7
HIC(d)	289.9
Impact Velocity (kph)	18.56
HIC T1 (msec)	5.7
HIC T2 (msec)	16.2

AP1 RH Side CA5102 - AP1-RH R2

FMH Headform 0062

Location: AP1-RH R2

Test Date: April 06, 2010

Work File: fmh

-----TEST RESULTS-----

Lab Temperature: 20 C

HICd: 289.9

Lab Humidity: 43.4 %

HIC (36ms): 163.7

Velocity at Impact: 18.56 KPH

t1: 5.7 msec

t2: 16.2 msec

Free Flight Distance: 218.55 mm

Duration: 10.5 msec

Maximum: 65.0 g

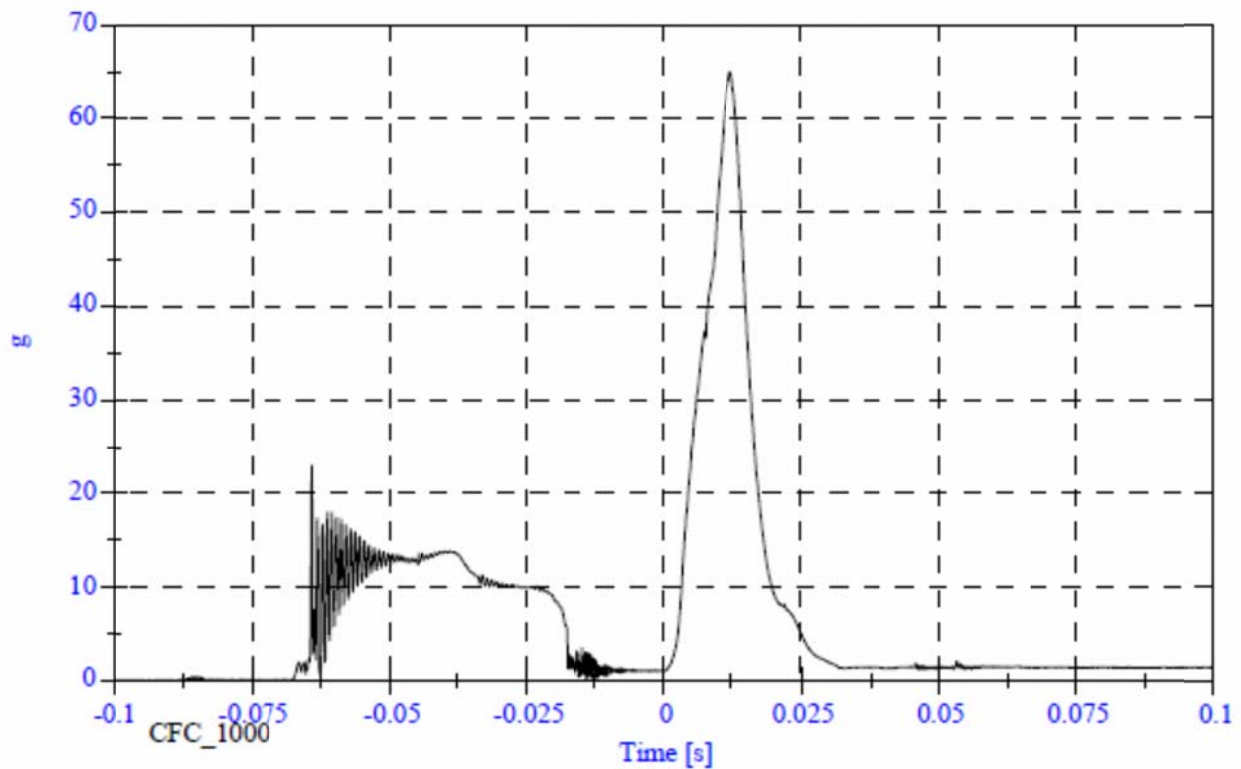
Average Acceleration: 6.7 g

AP1 RH Side

Headform Resultant

Max: 65.0 [g] at 0.012 [s]

Min: 0.0 [g] at -0.089 [s]

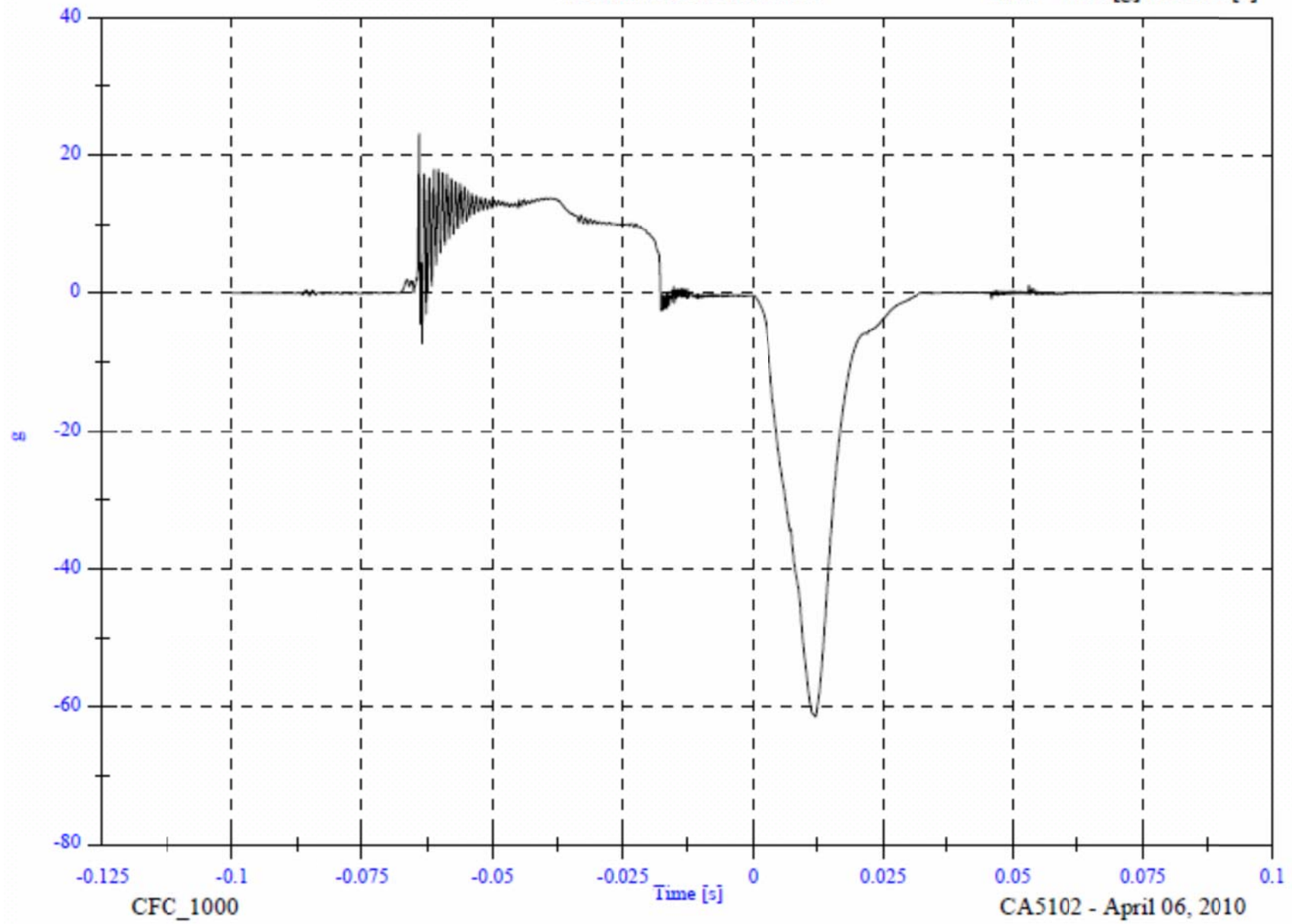


AP1 RH Side

Headform X Acceleration

Max: 23.0 [g] at -0.064 [s]

Min: -61.4 [g] at 0.012 [s]

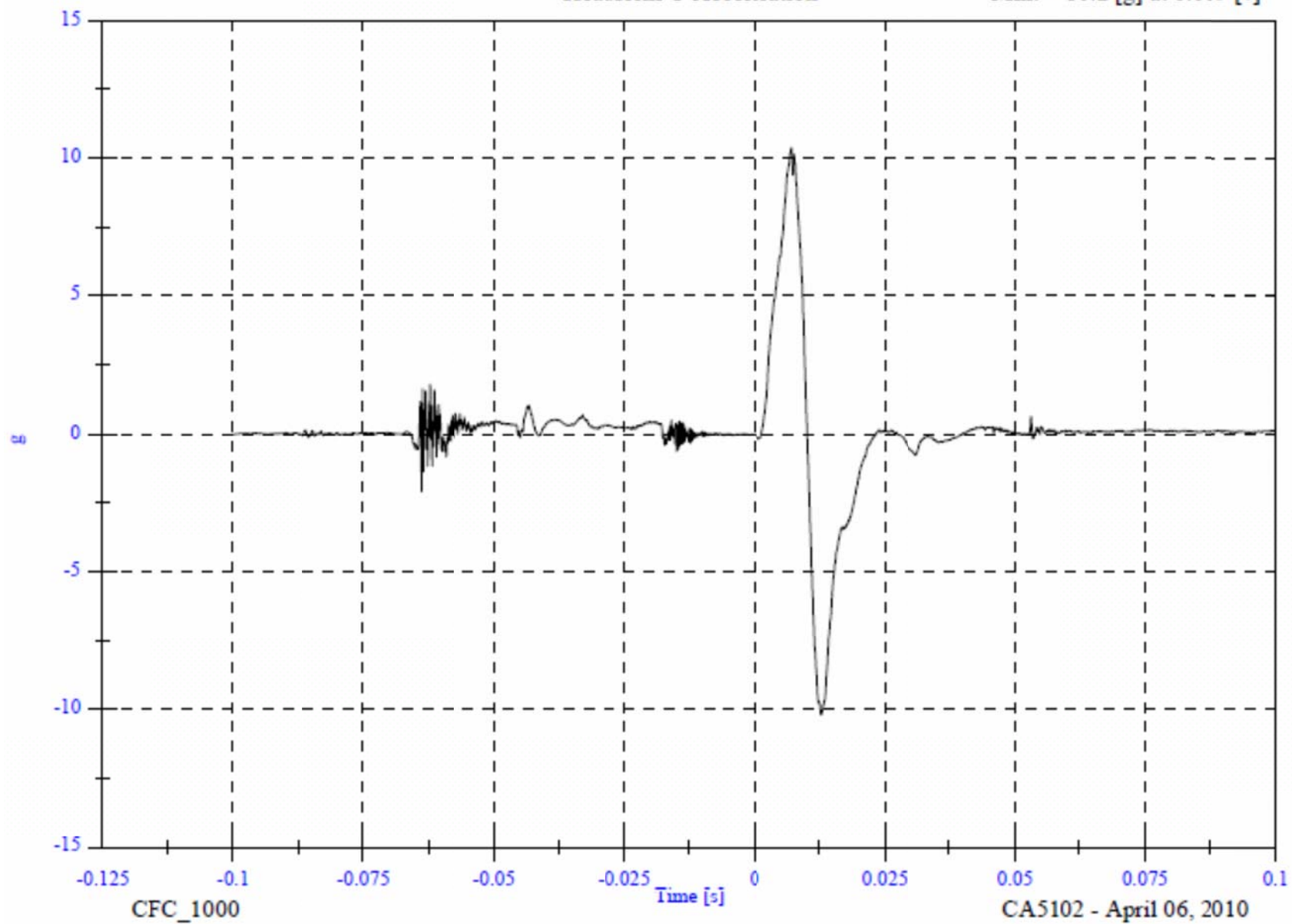


AP1 RH Side

Headform Y Acceleration

Max: 10.4 [g] at 0.007 [s]

Min: -10.2 [g] at 0.013 [s]

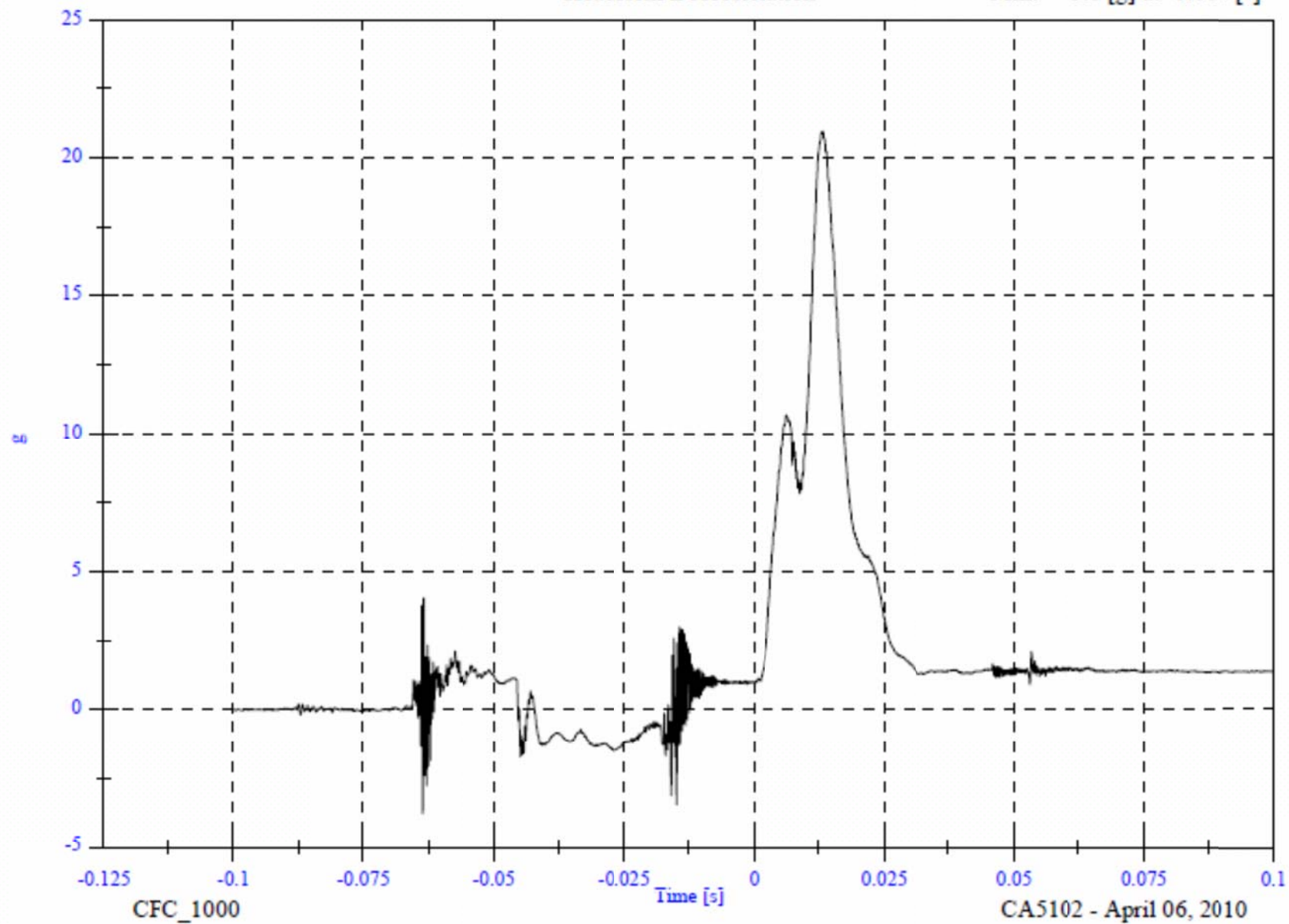


AP1 RH Side

Headform Z Acceleration

Max: 21.0 [g] at 0.013 [s]

Min: -3.8 [g] at -0.064 [s]

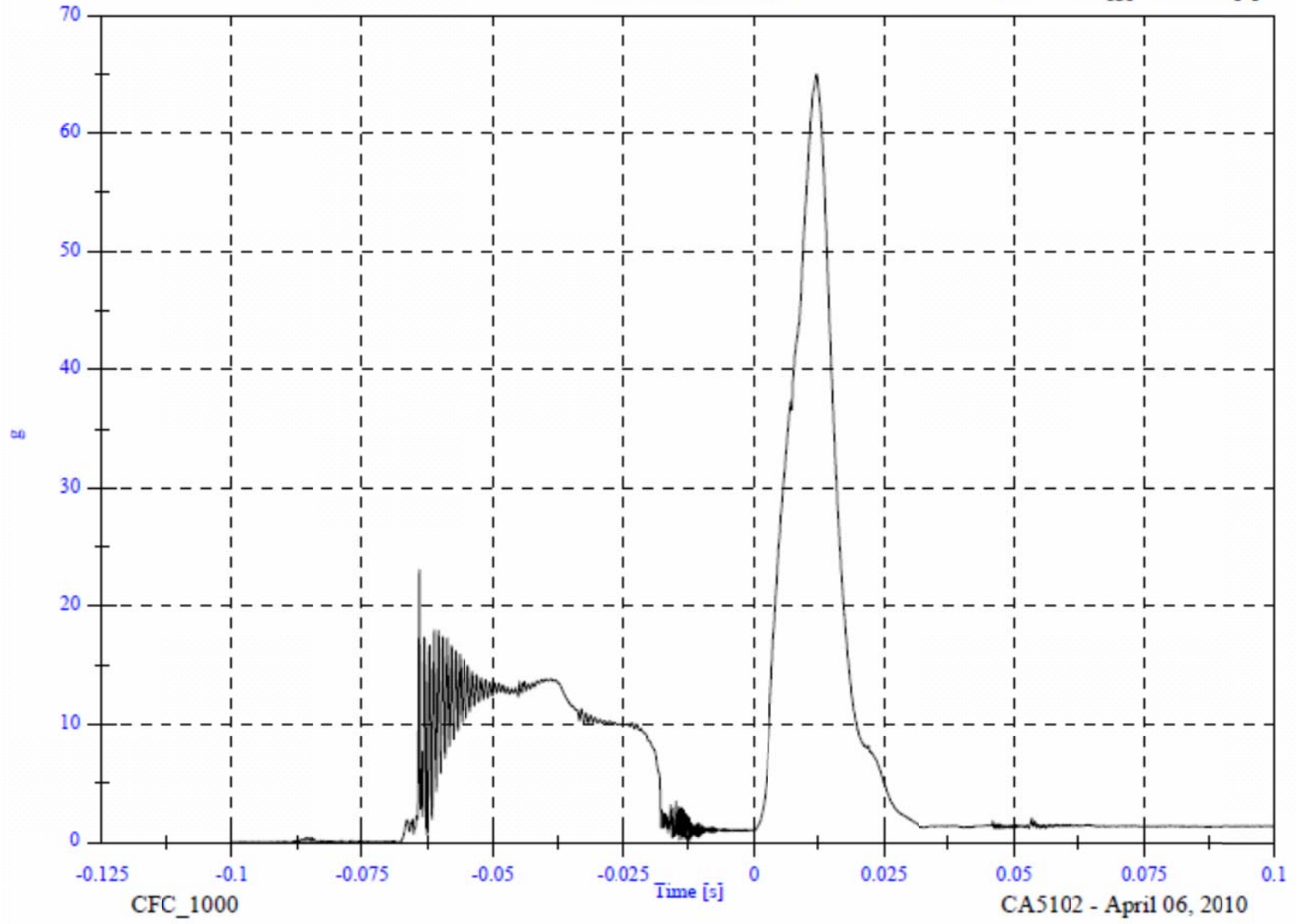


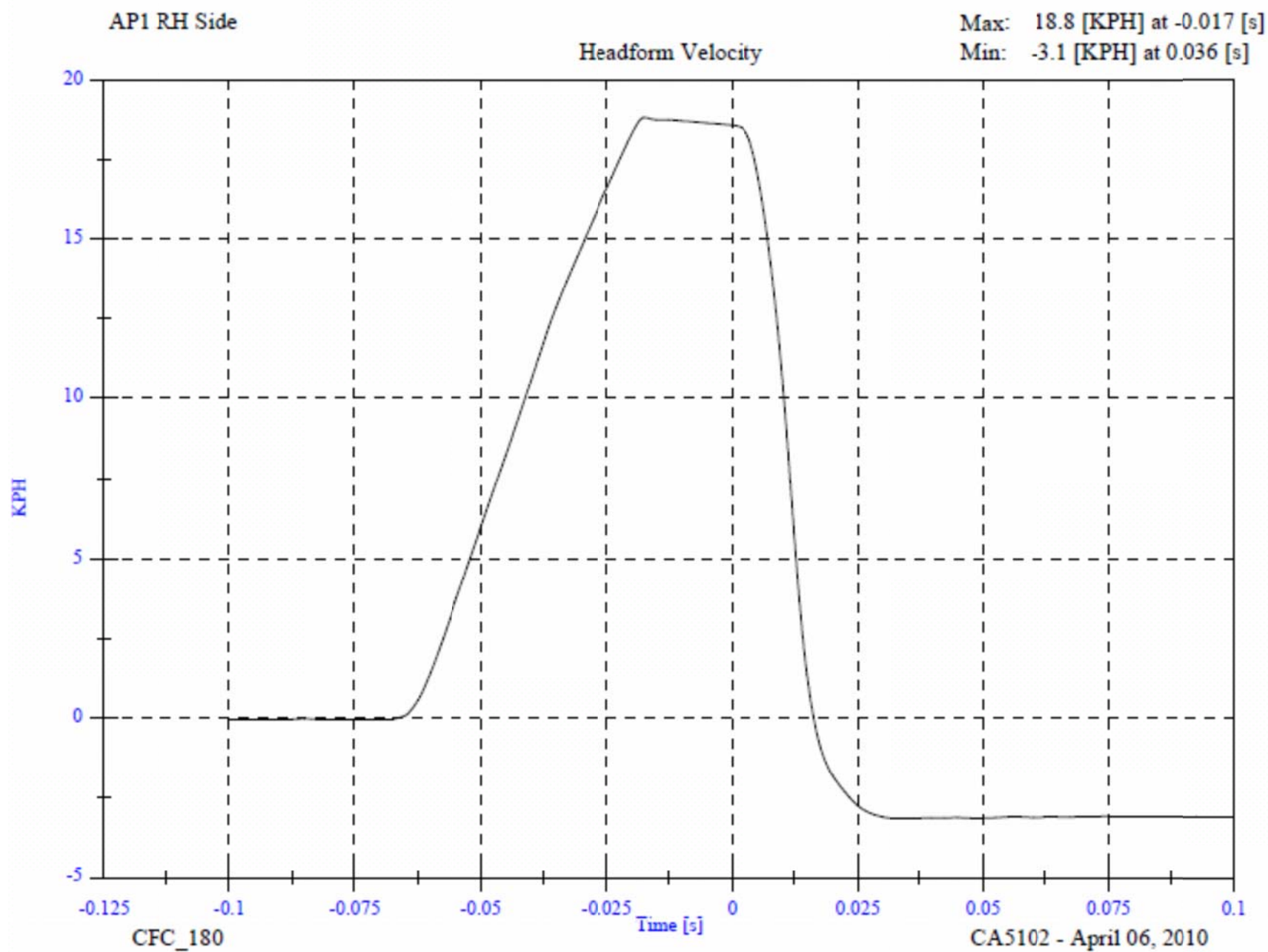
AP1 RH Side

Headform Resultant

Max: 65.0 [g] at 0.012 [s]

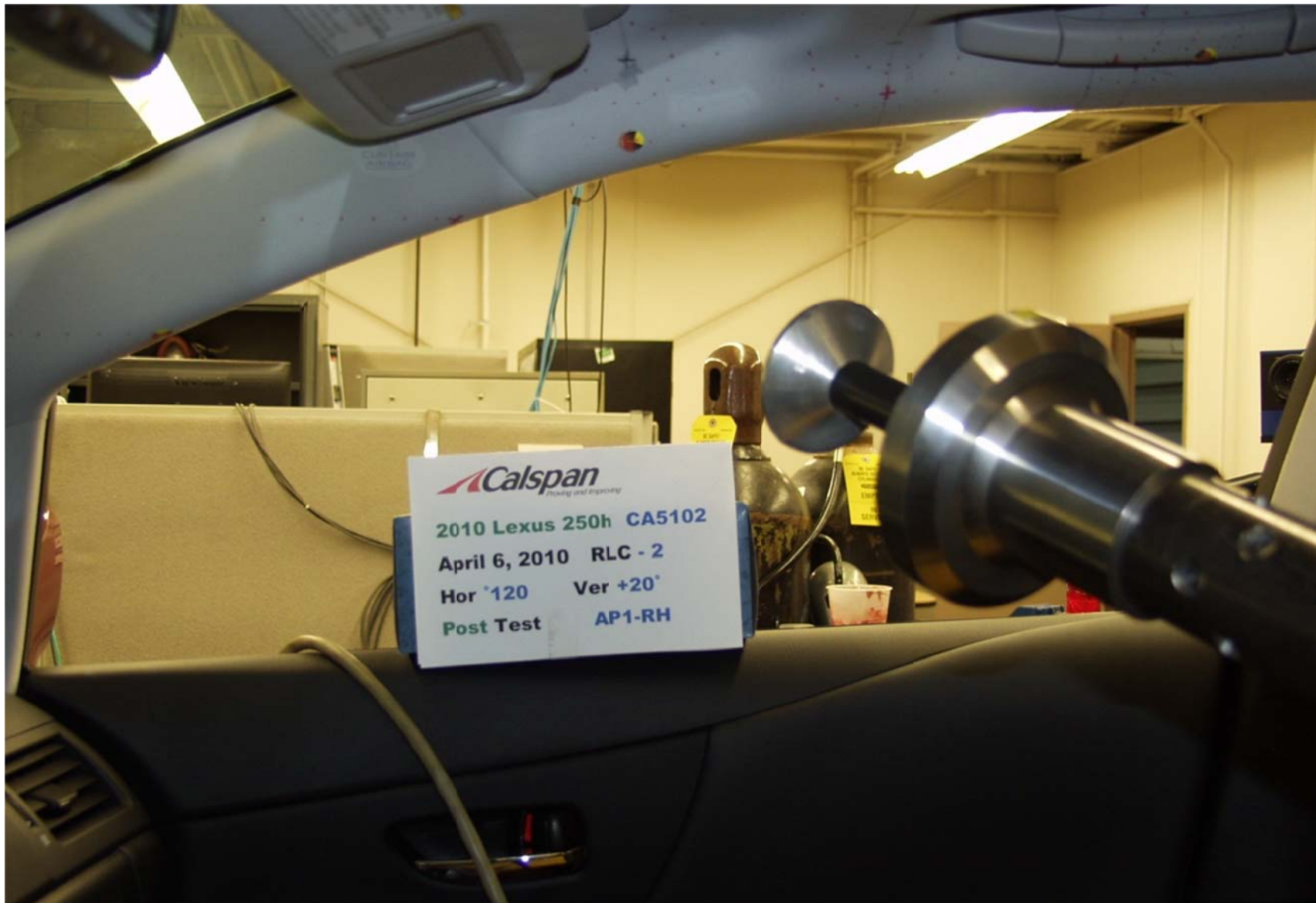
Min: 0.0 [g] at -0.089 [s]







PRE-IMPACT AP1 RH

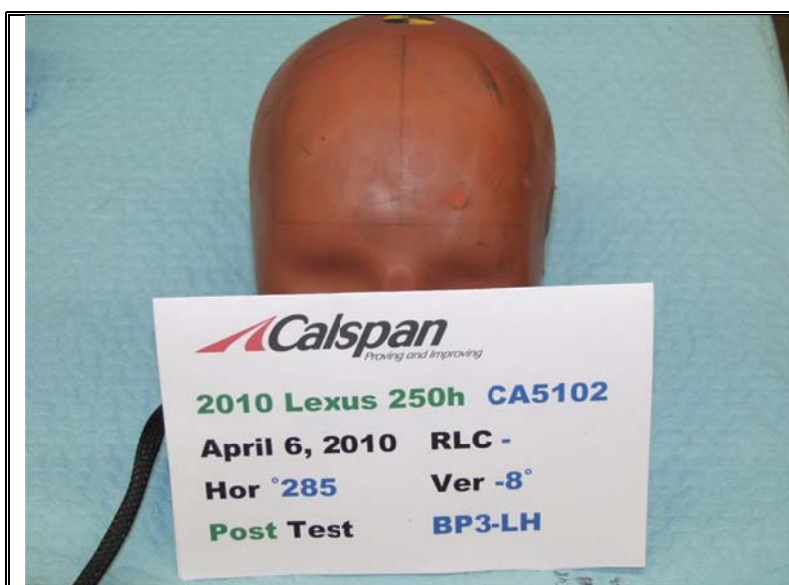


POST-IMPACT AP1 RH

VEHICLE YEAR/MAKE/MODEL/STYLE:	2010 Lexus 250h
VIN:	JTHBB1BA5A2014110
DATE OF MANUFACTURE:	11/09 (SEE CERTIFICATION LABEL)
COLOR:	Red

Test Number:	08
Test Date:	6 April 2010
Target Location:	BP3 LH
Target Code:	BP3 LH
Horizontal Impact Angle:	285
Vertical Impact Angle:	-8
Ambient Temperature:	21
Relative Humidity:	45.0%
Time of Impact:	2:00
Headform Number:	0355

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	-28	<input type="checkbox"/>	mm right <input checked="" type="checkbox"/> mm left
On Centerline	10		mm up



POST-IMPACT BP3 LH HEADFORM

Free Motion HIC	394.7
HIC(d)	464.2
Impact Velocity (kph)	23.69
HIC T1 (msec)	4.9
HIC T2 (msec)	11.8

BP3 LH Side CA5102 - BP3-LH

FMH Headform 0355

Location: BP3-LH

Test Date: April 06, 2010

Work File: fmh

-----TEST RESULTS-----

Lab Temperature: 21 C

HICd: 464.2

Lab Humidity: 45 %

HIC (36ms): 394.7

Velocity at Impact: 23.69 KPH

t1: 4.9 msec

t2: 11.8 msec

Free Flight Distance: 221.18 mm

Duration: 6.9 msec

Maximum: 100.0 g

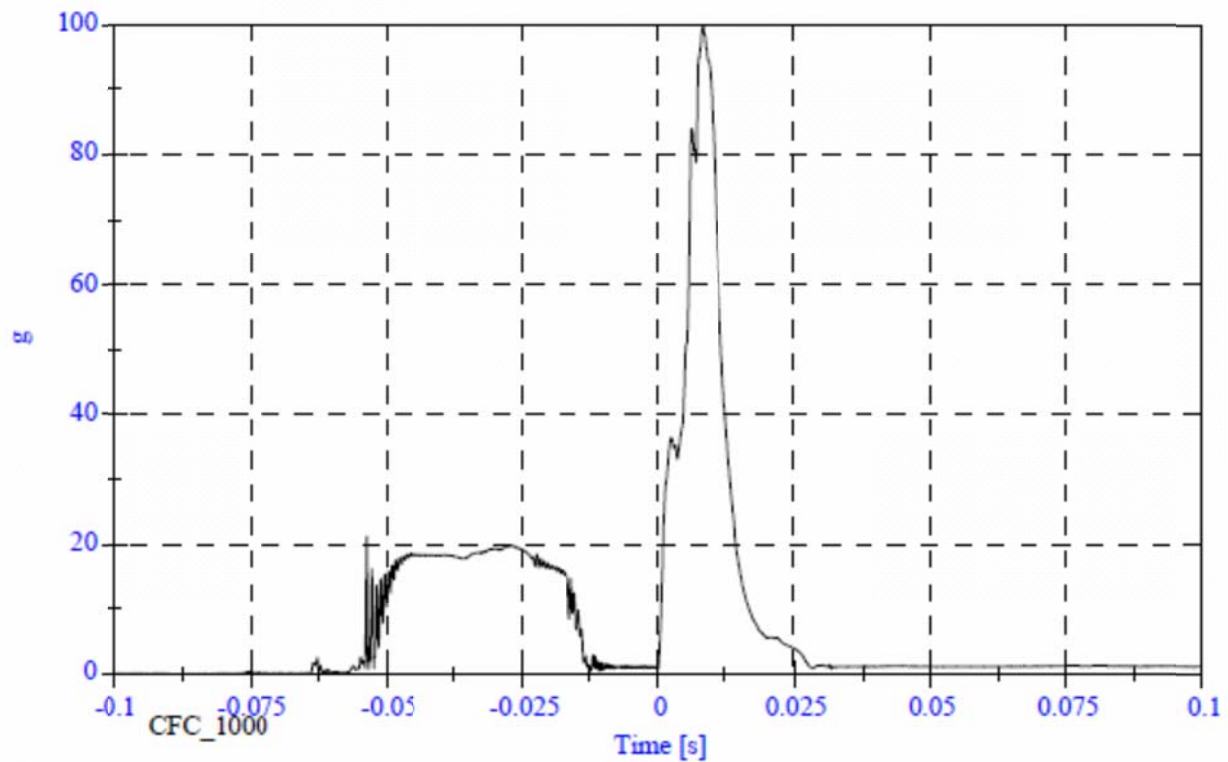
Average Acceleration: 8.3 g

BP3 LH Side

Headform Resultant

Max: 100.0 [g] at 0.008 [s]

Min: 0.0 [g] at -0.086 [s]

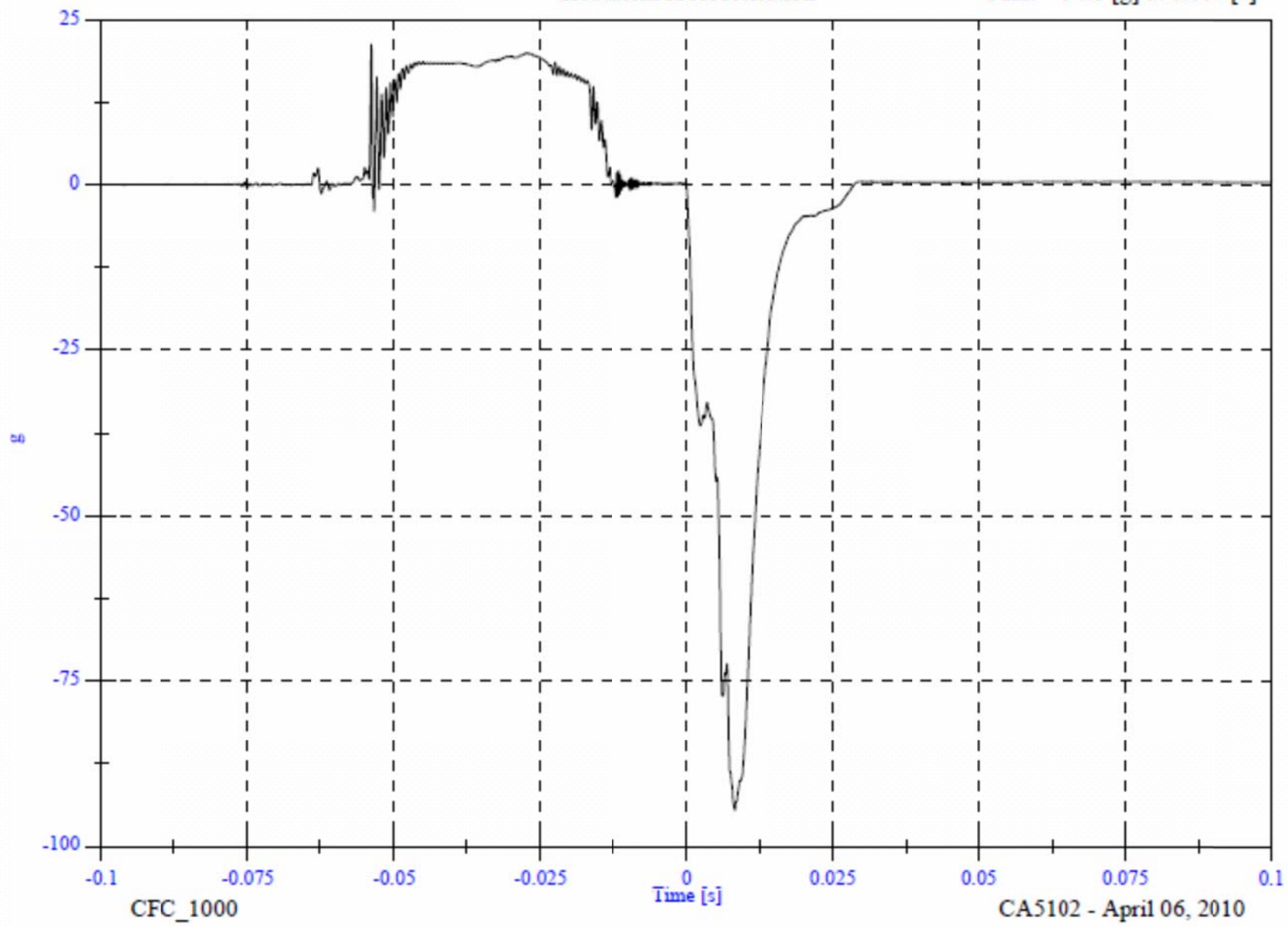


BP3 LH Side

Headform X Acceleration

Max: 21.2 [g] at -0.054 [s]

Min: -94.5 [g] at 0.008 [s]

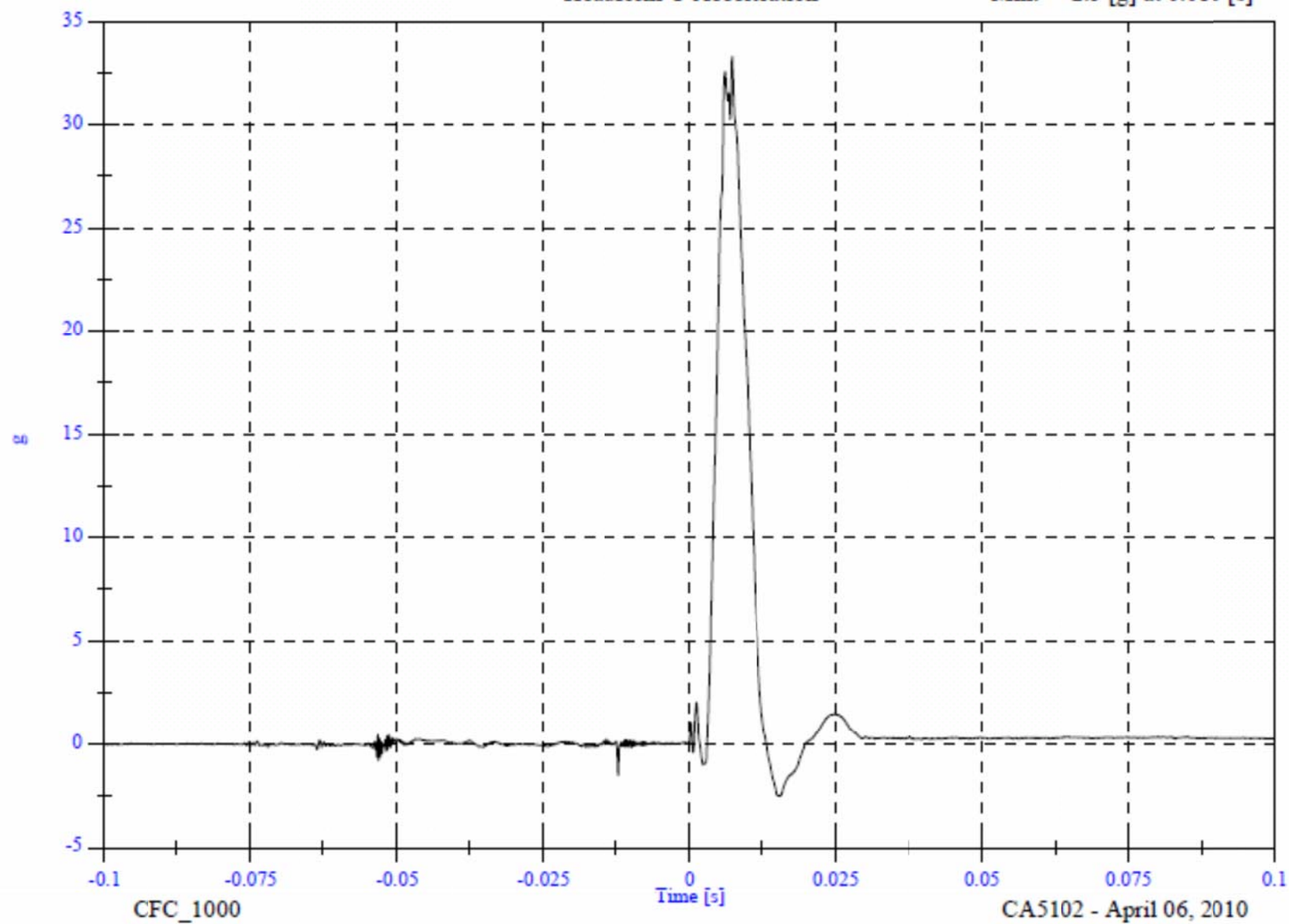


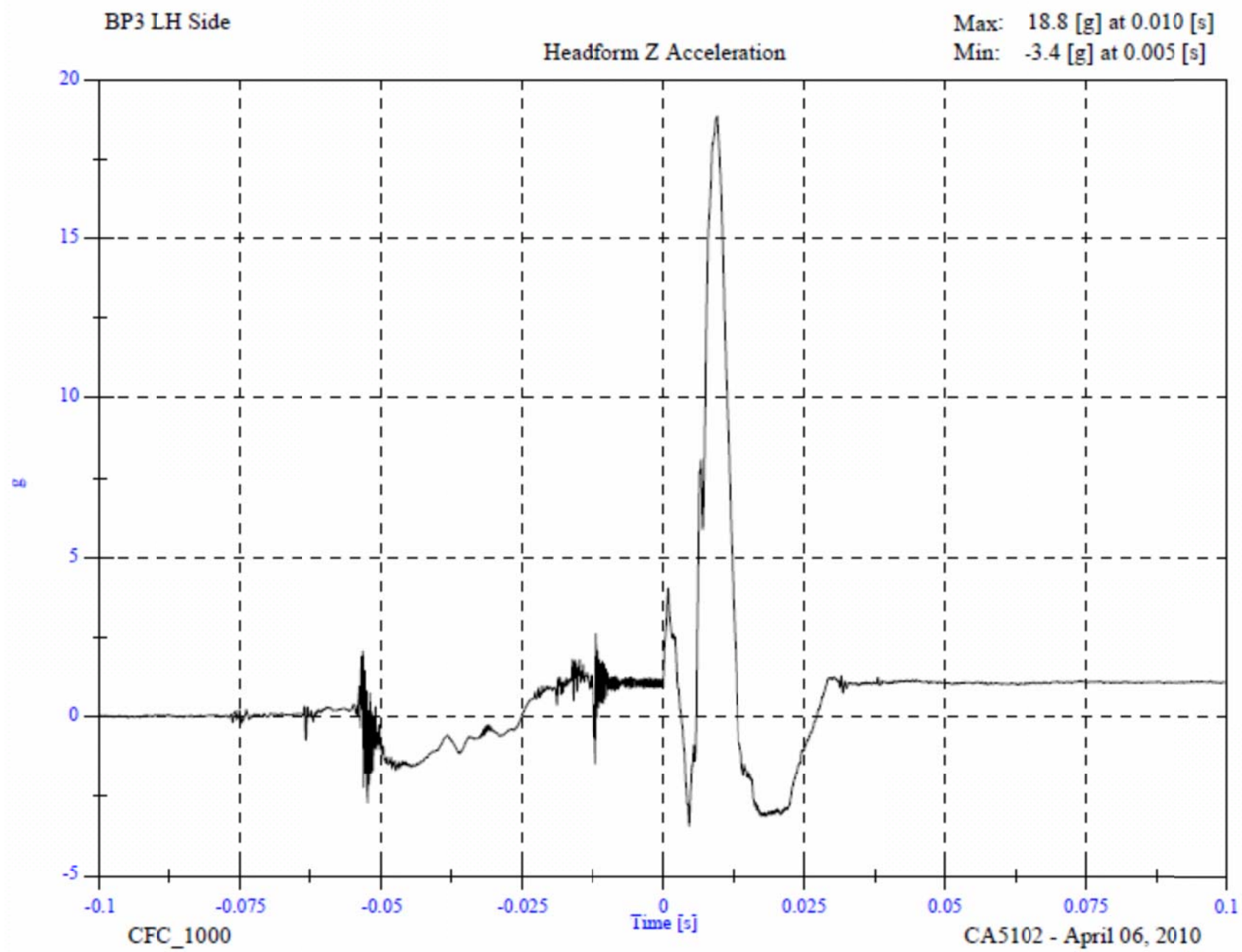
BP3 LH Side

Headform Y Acceleration

Max: 33.3 [g] at 0.007 [s]

Min: -2.5 [g] at 0.016 [s]



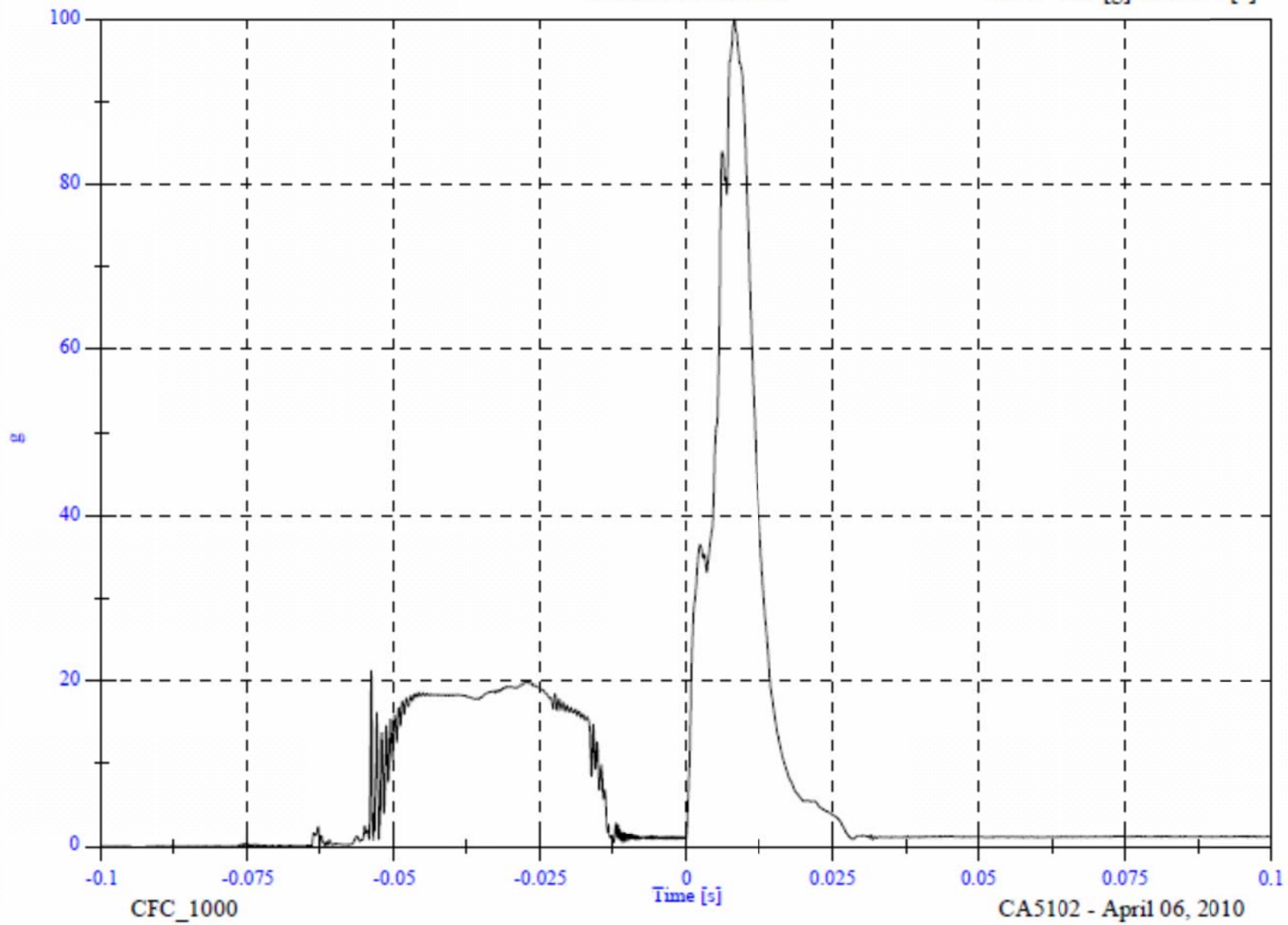


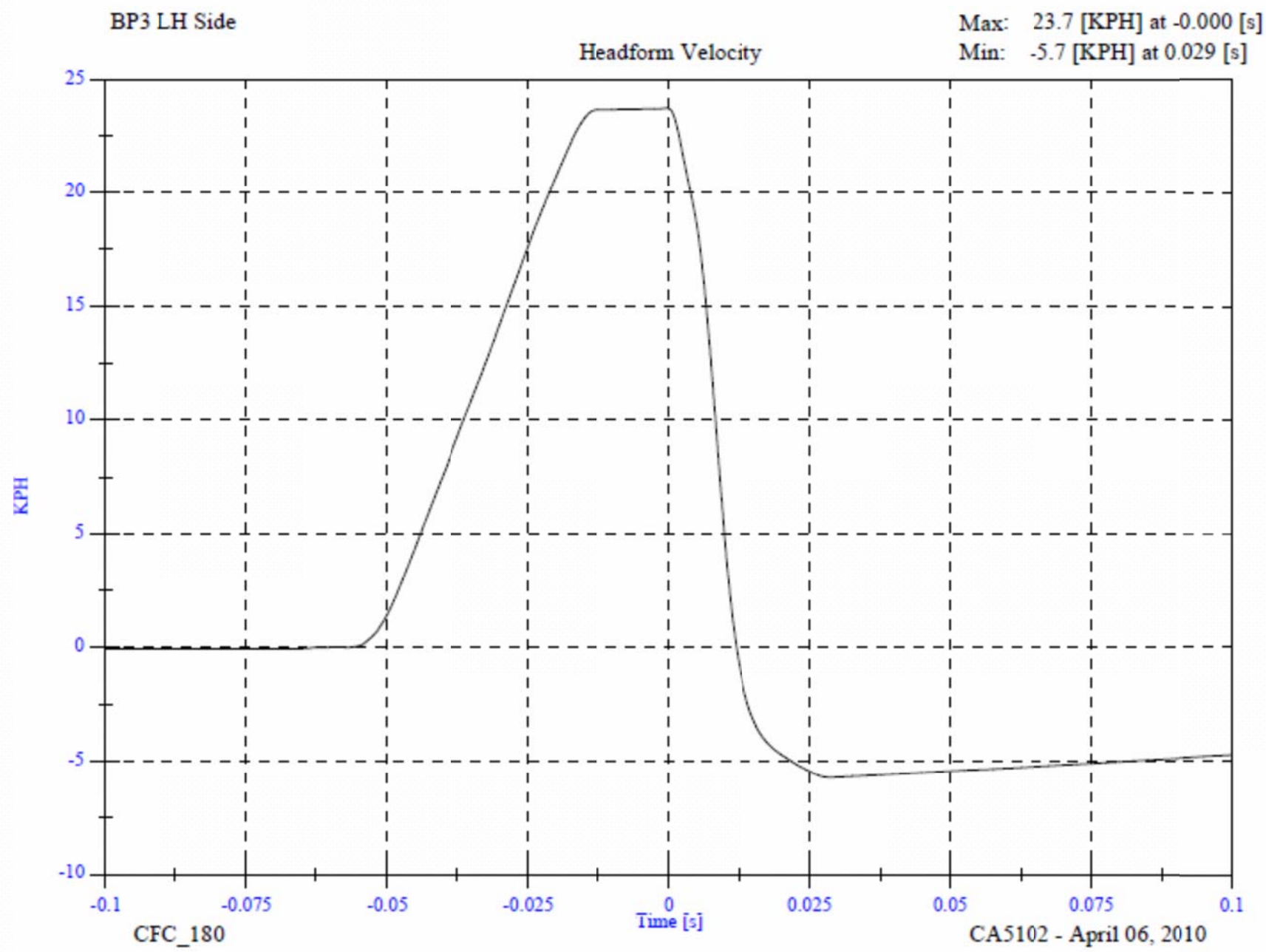
BP3 LH Side

Headform Resultant

Max: 100.0 [g] at 0.008 [s]

Min: 0.0 [g] at -0.086 [s]







PRE-IMPACT BP3 LH



VEHICLE YEAR/MAKE/MODEL/STYLE:	2010 Lexus 250h
VIN:	JTHBB1BA5A2014110
DATE OF MANUFACTURE:	11/09 (SEE CERTIFICATION LABEL)
COLOR:	Red

Test Number:	09
Test Date:	6 April 2010
Target Location:	BP1 LH
Target Code:	BP1 LH
Horizontal Impact Angle:	270
Vertical Impact Angle:	25
Ambient Temperature:	21
Relative Humidity:	46.1%
Time of Impact:	2:38
Headform Number:	0805

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	-9	<input type="checkbox"/> mm right	<input checked="" type="checkbox"/> mm left
On Centerline	81	mm up	



POST-IMPACT BP1 LH HEADFORM

Free Motion HIC	265.0
HIC(d)	366.3
Impact Velocity (kph)	18.37
HIC T1 (msec)	6.5
HIC T2 (msec)	15.7

BP1 LH Side CA5102 - BP1-LH

FMH Headform 0805

Location: BP1-LH

Test Date: April 06, 2010

Work File: fmh

-----TEST RESULTS-----

Lab Temperature: 21 C

HICd: 366.3

Lab Humidity: 46.1 %

HIC (36ms): 265.0

Velocity at Impact: 18.37 KPH

t1: 6.5 msec

t2: 15.7 msec

Free Flight Distance: 229.63 mm

Duration: 9.2 msec

Maximum: 80.2 g

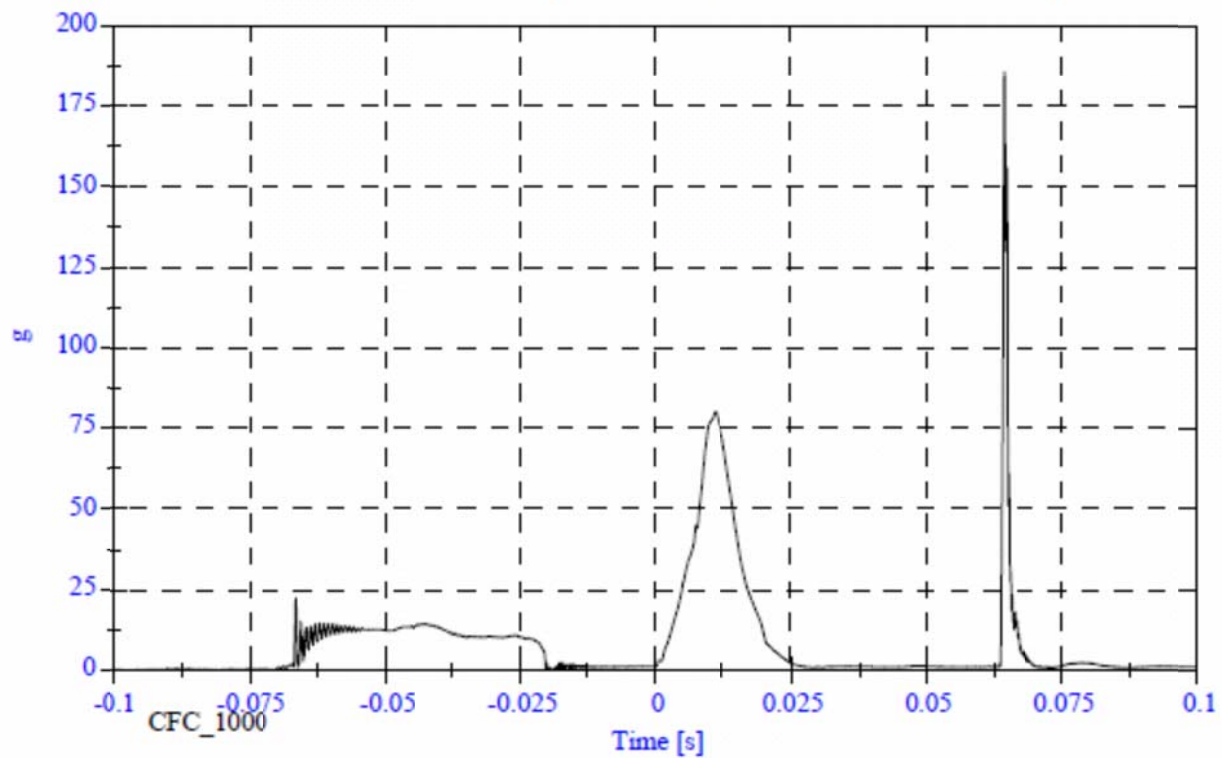
Average Acceleration: 8.2 g

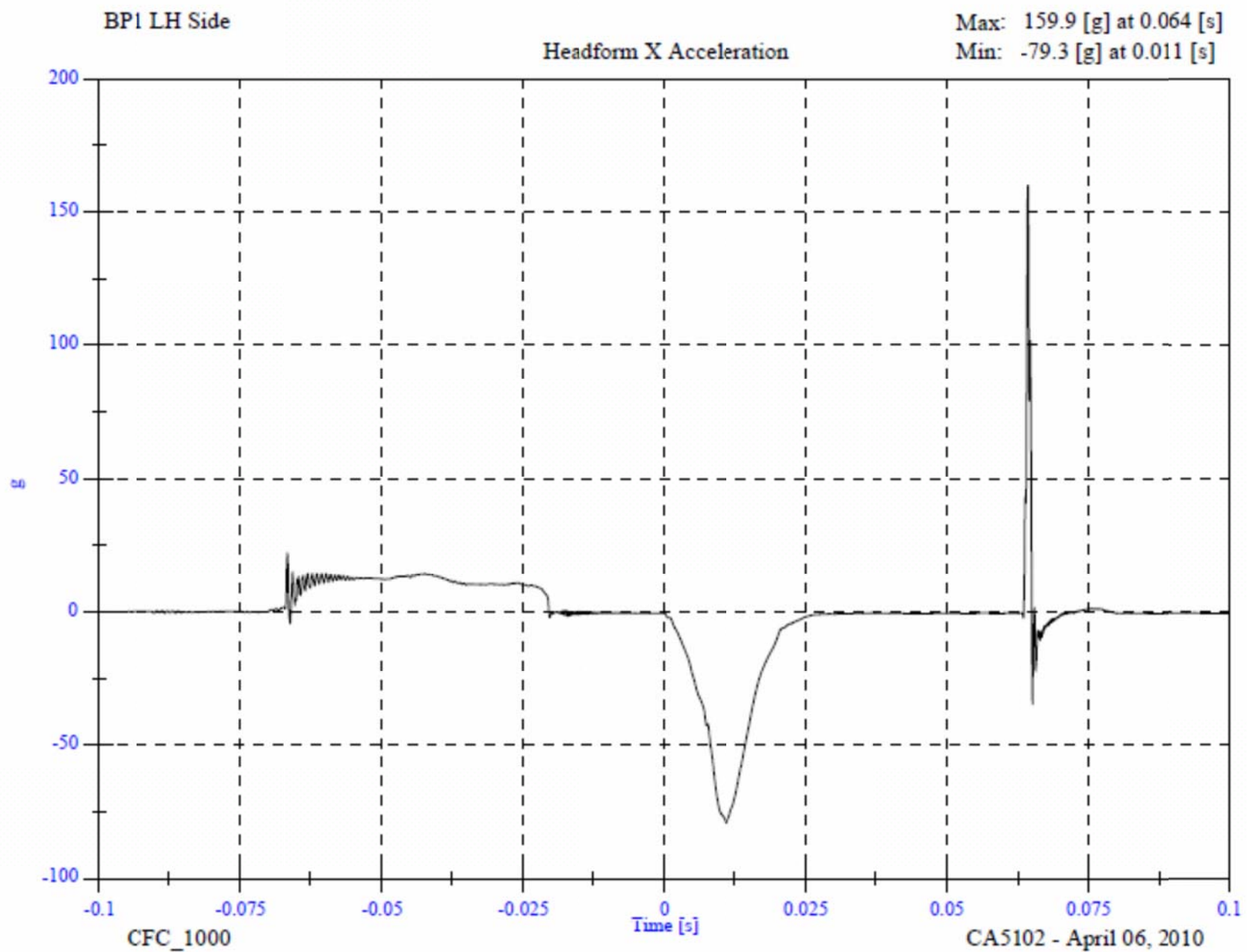
BP1 LH Side

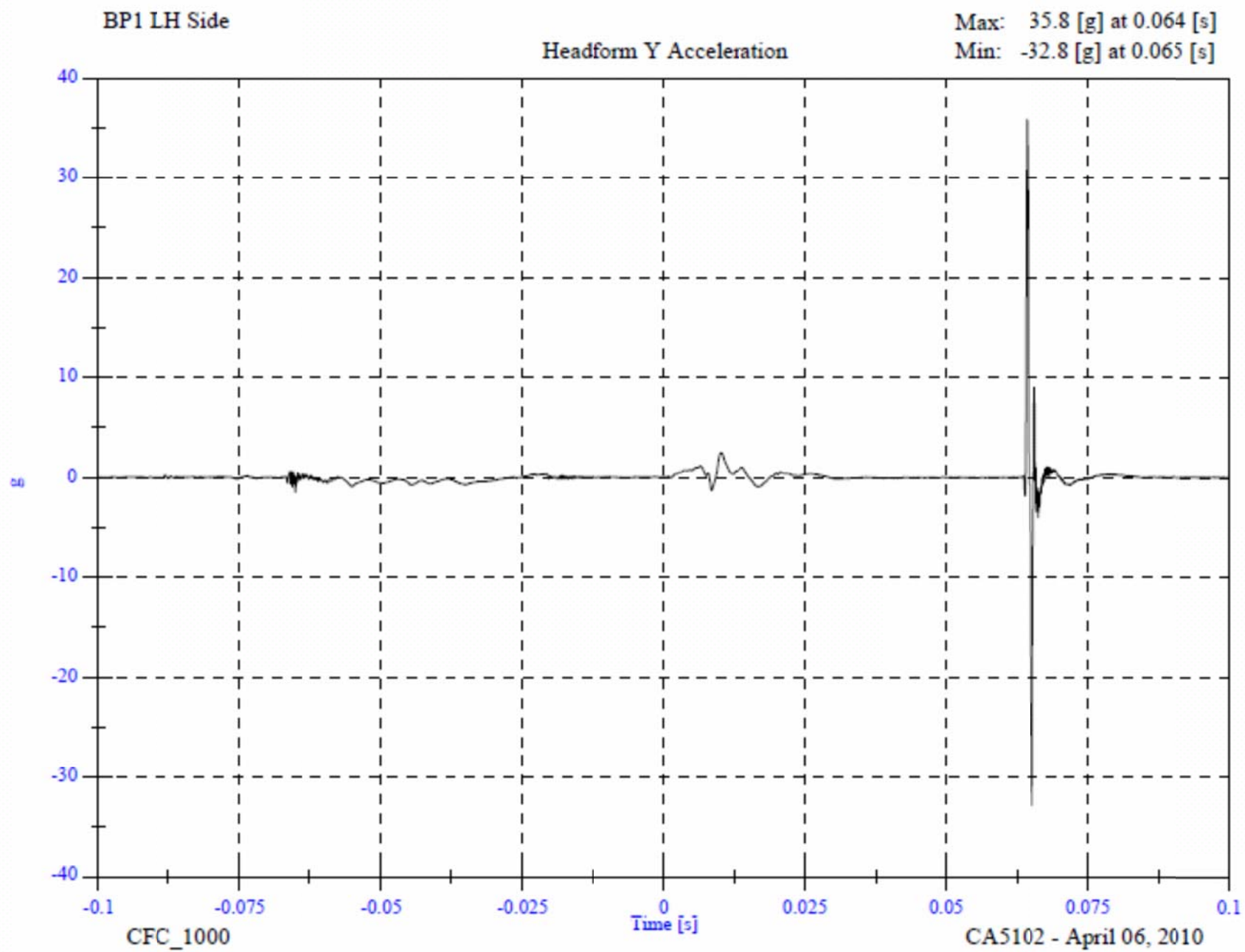
Headform Resultant

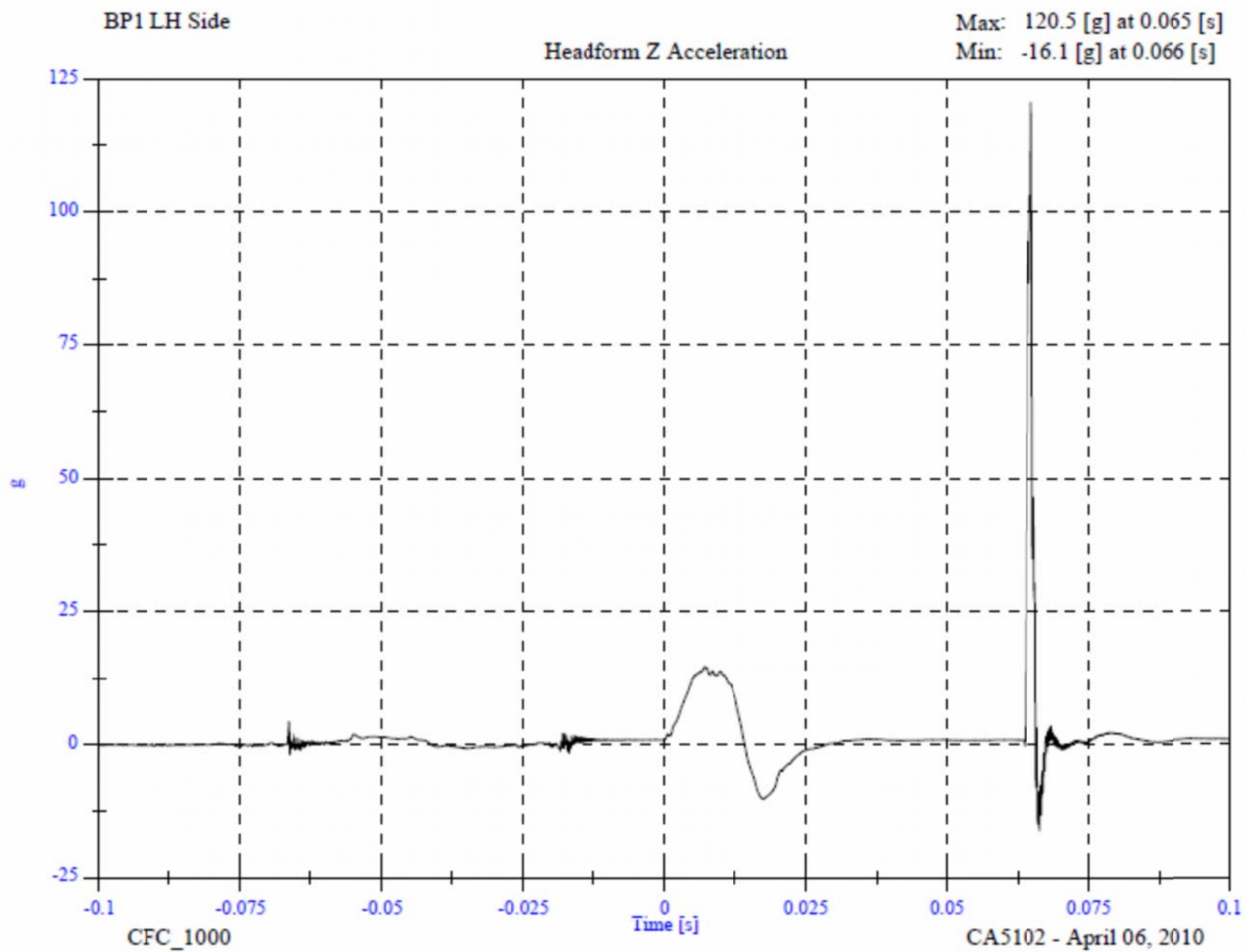
Max: 80.2 [g] at 0.011 [s]

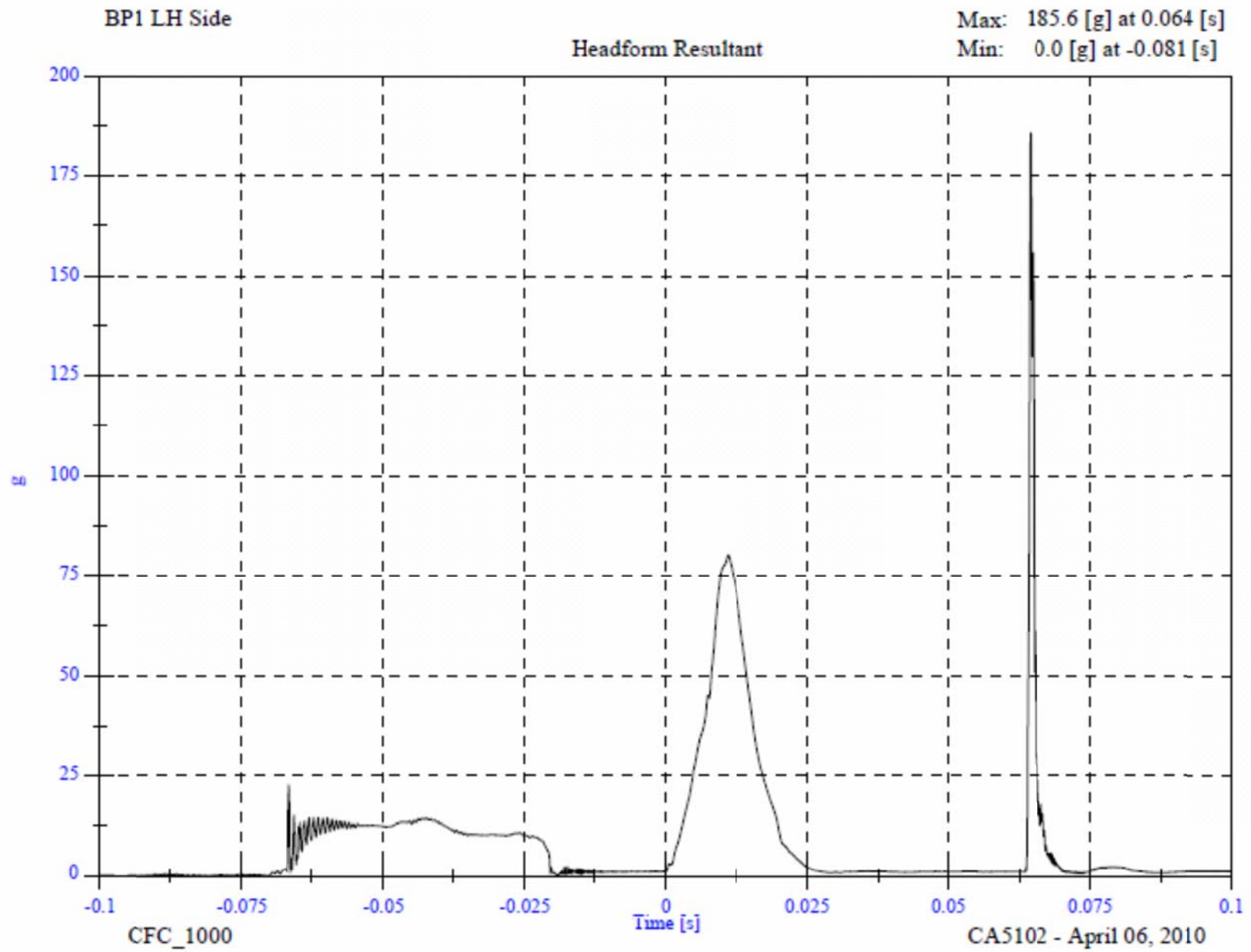
Min: 0.0 [g] at -0.081 [s]

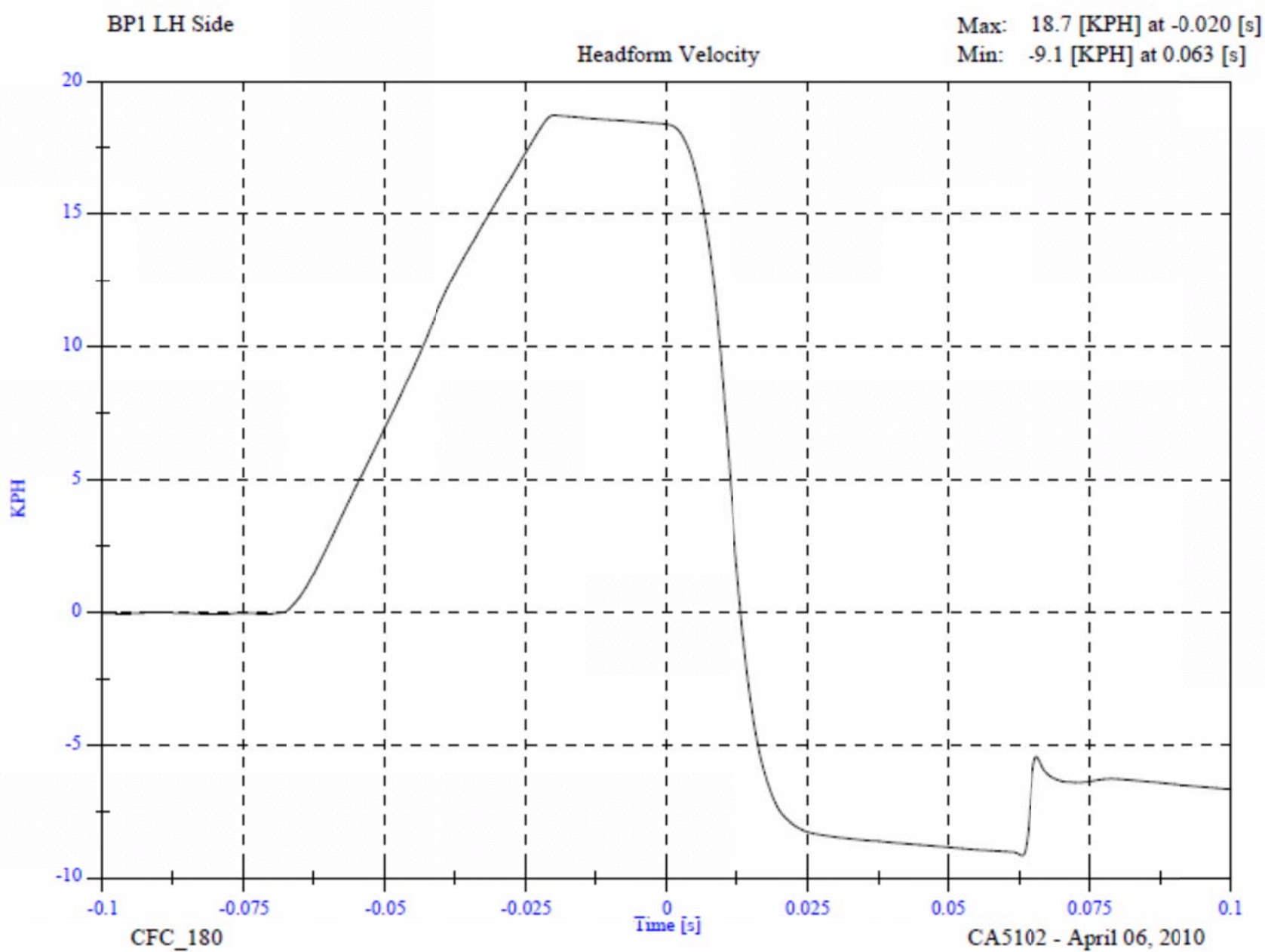


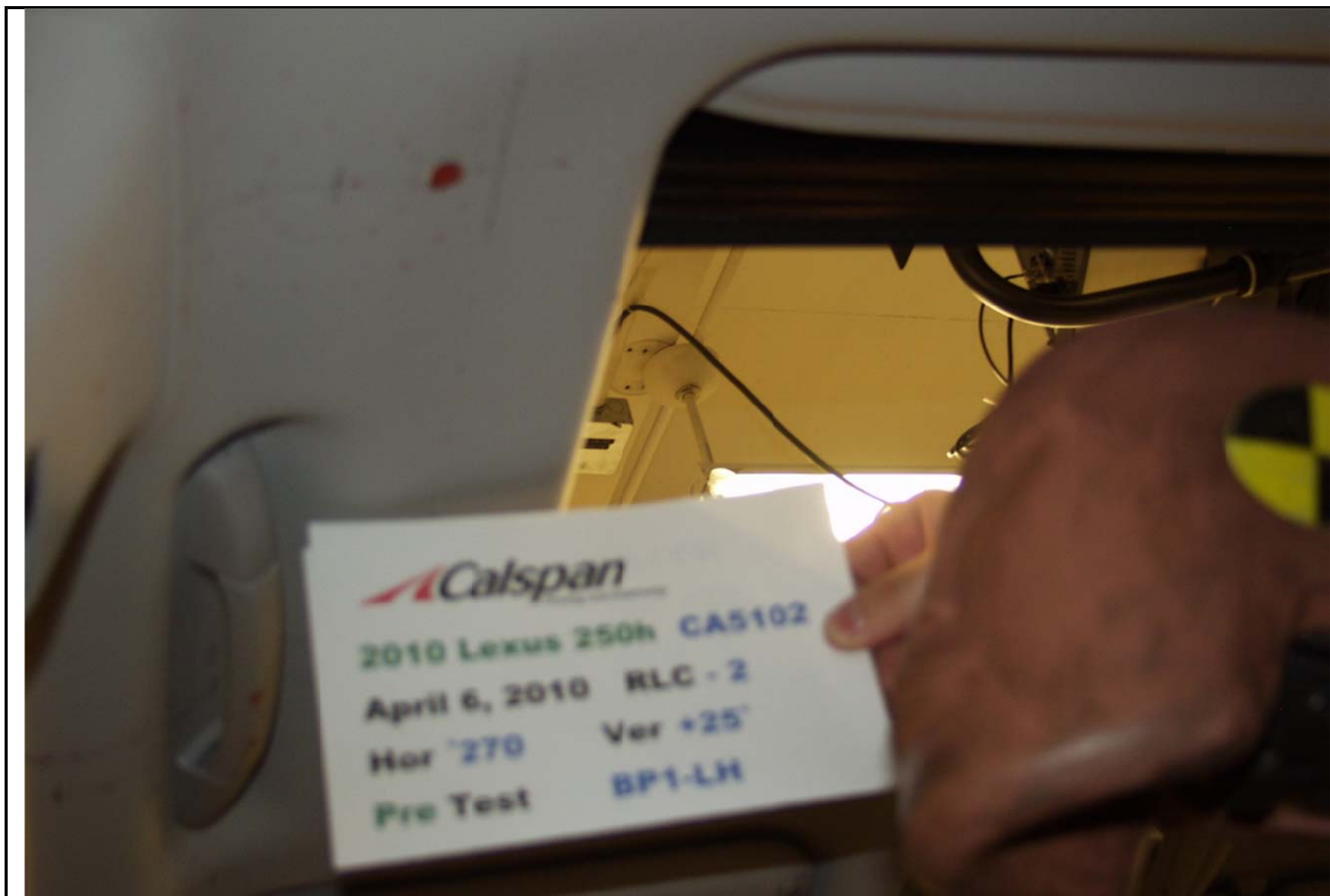












PRE-IMPACT BP1 LH



POST-IMPACT BP1 LH

VEHICLE YEAR/MAKE/MODEL/STYLE:	2010 Lexus 250h
VIN:	JTHBB1BA5A2014110
DATE OF MANUFACTURE:	11/09 (SEE CERTIFICATION LABEL)
COLOR:	Red

Test Number:	10
Test Date:	6 April 2010
Target Location:	AP2 LH
Target Code:	AP2 LH
Horizontal Impact Angle:	203
Vertical Impact Angle:	50
Ambient Temperature:	21
Relative Humidity:	48.1%
Time of Impact:	3:40
Headform Number:	1140

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	-6	<input type="checkbox"/> mm right	<input checked="" type="checkbox"/> mm left
On Centerline	19	mm up	



POST-IMPACT AP2 LH HEADFORM

Free Motion HIC	311.4
HIC(d)	401.3
Impact Velocity (kph)	18.34
HIC T1 (msec)	7.3
HIC T2 (msec)	13.3

AP2 LH Side CA5102 - AP2-LH

FMH Headform 1140

Location: AP2-LH

Test Date: April 06, 2010

Work File: fmh

-----TEST RESULTS-----

Lab Temperature: 21 C

HICd: 401.3

Lab Humidity: 48.1 %

HIC (36ms): 311.4

Velocity at Impact: 18.34 KPH

t1: 7.3 msec

t2: 13.3 msec

Free Flight Distance: 223.56 mm

Duration: 6.0 msec

Maximum: 120.5 g

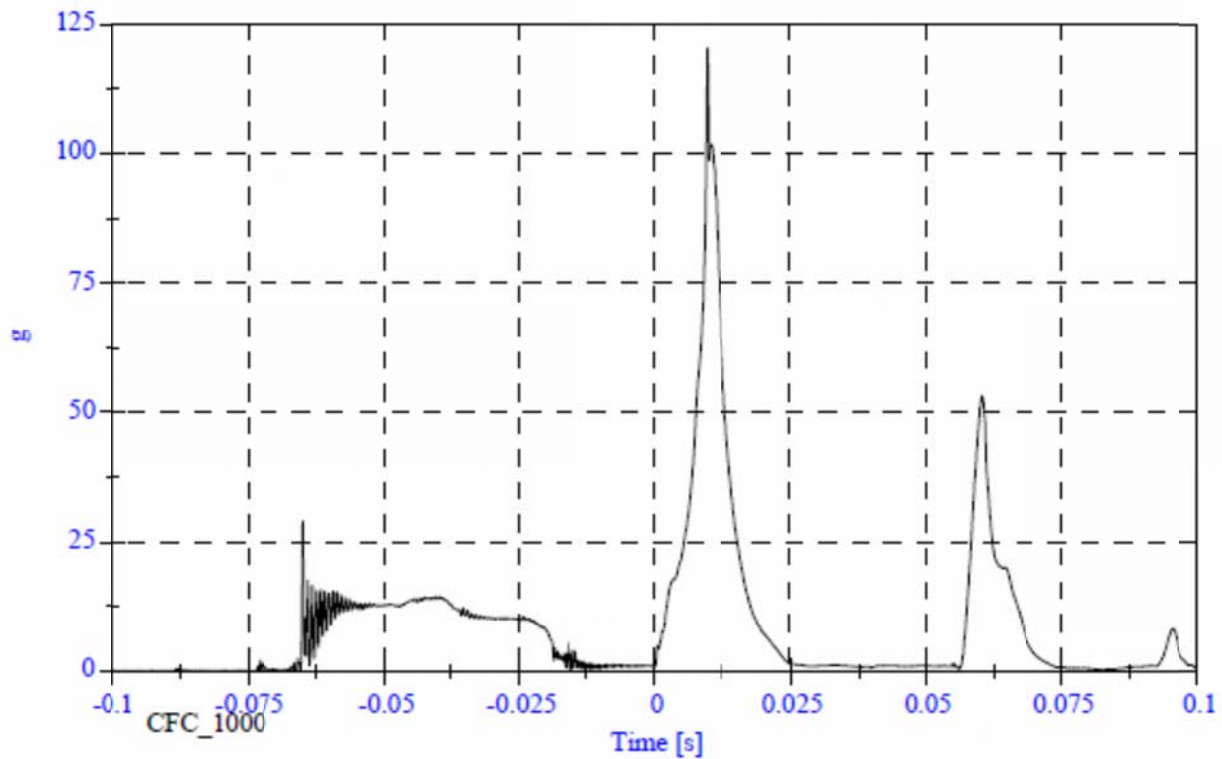
Average Acceleration: 8.5 g

AP2 LH Side

Headform Resultant

Max: 120.5 [g] at 0.010[s]

Min: 0.0 [g] at -0.079 [s]

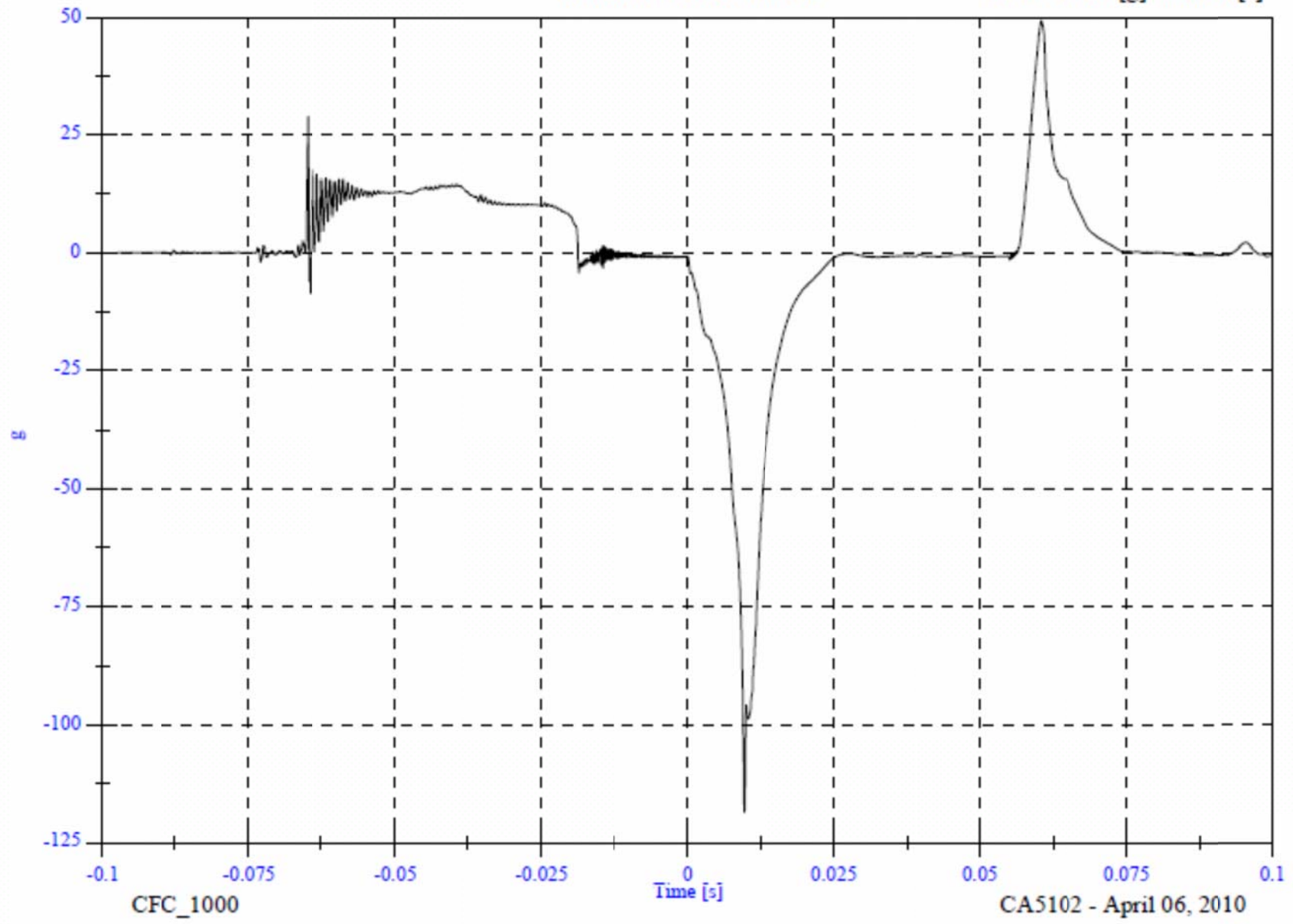


AP2 LH Side

Headform X Acceleration

Max: 49.3 [g] at 0.060 [s]

Min: -118.4 [g] at 0.010 [s]

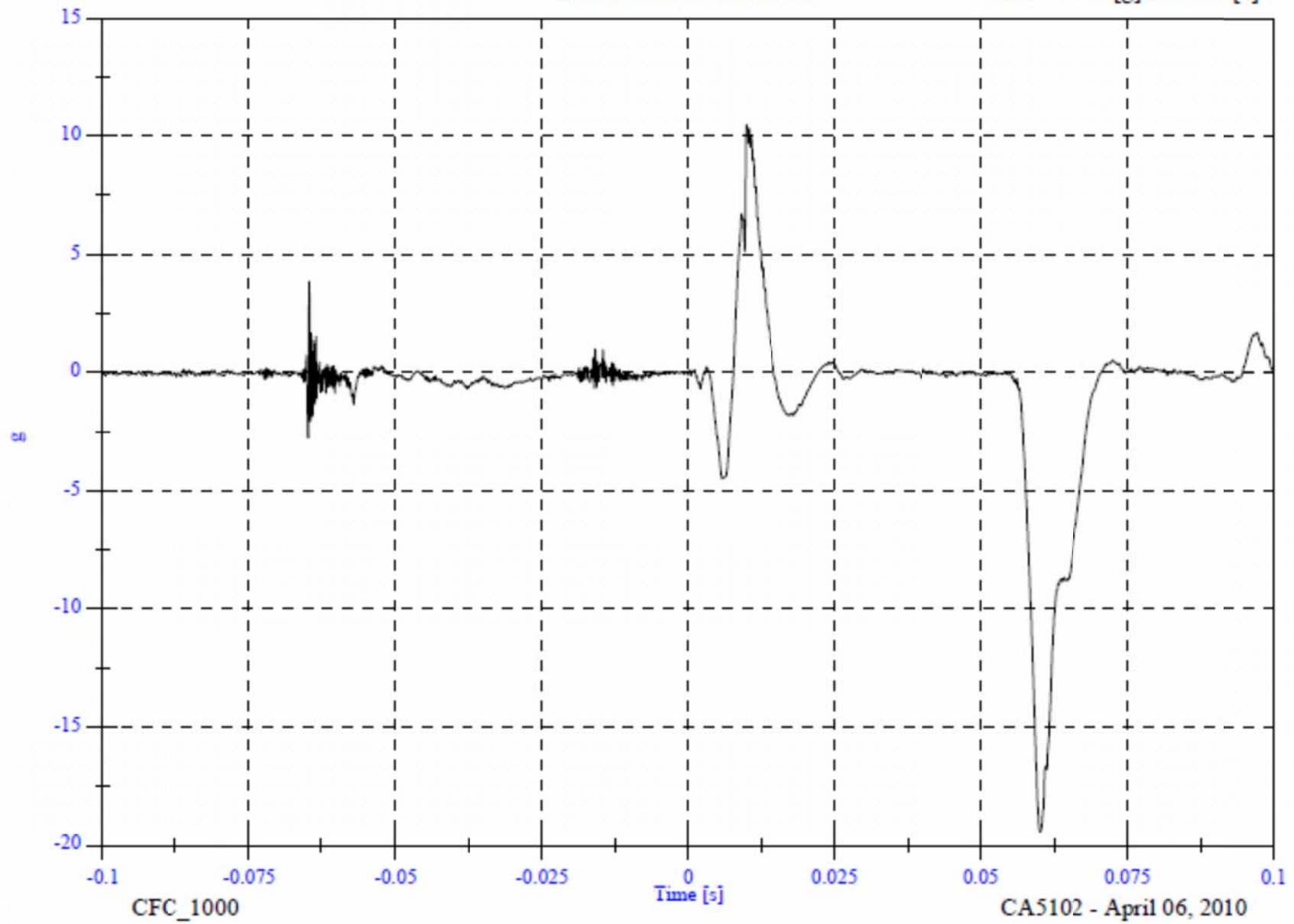


AP2 LH Side

Headform Y Acceleration

Max: 10.5 [g] at 0.010 [s]

Min: -19.4 [g] at 0.060 [s]

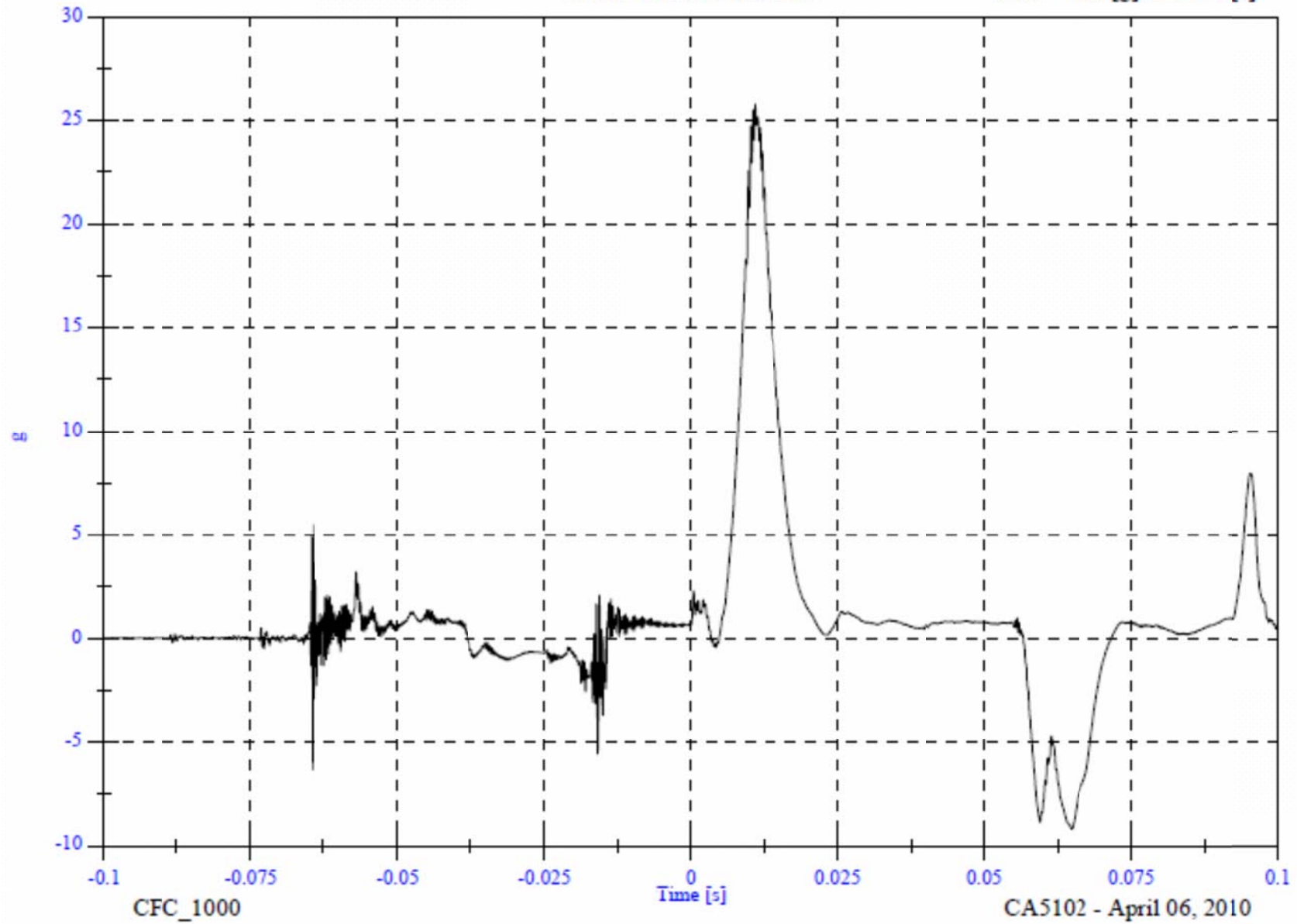


AP2 LH Side

Headform Z Acceleration

Max: 25.8 [g] at 0.011 [s]

Min: -9.2 [g] at 0.065 [s]

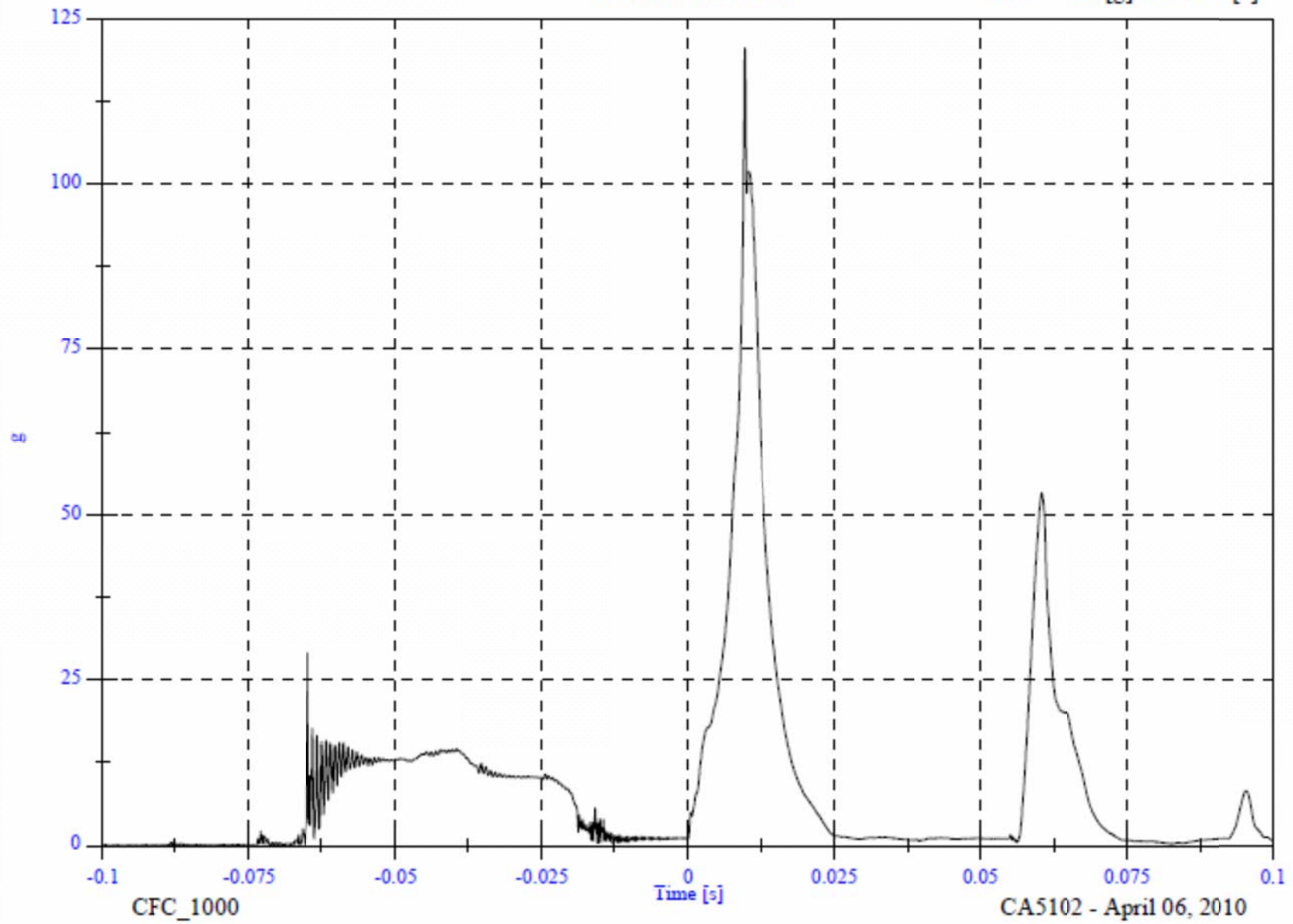


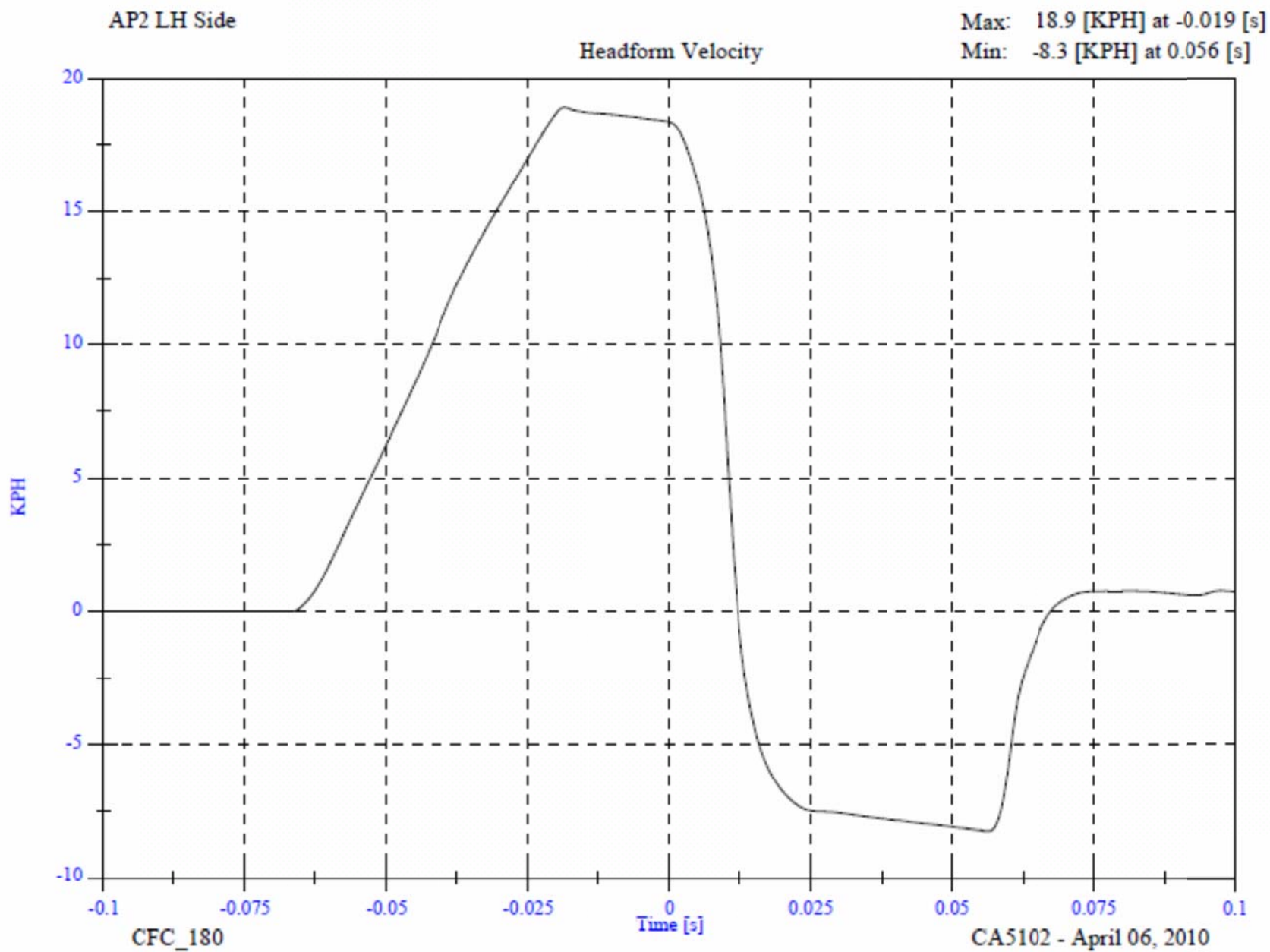
AP2 LH Side

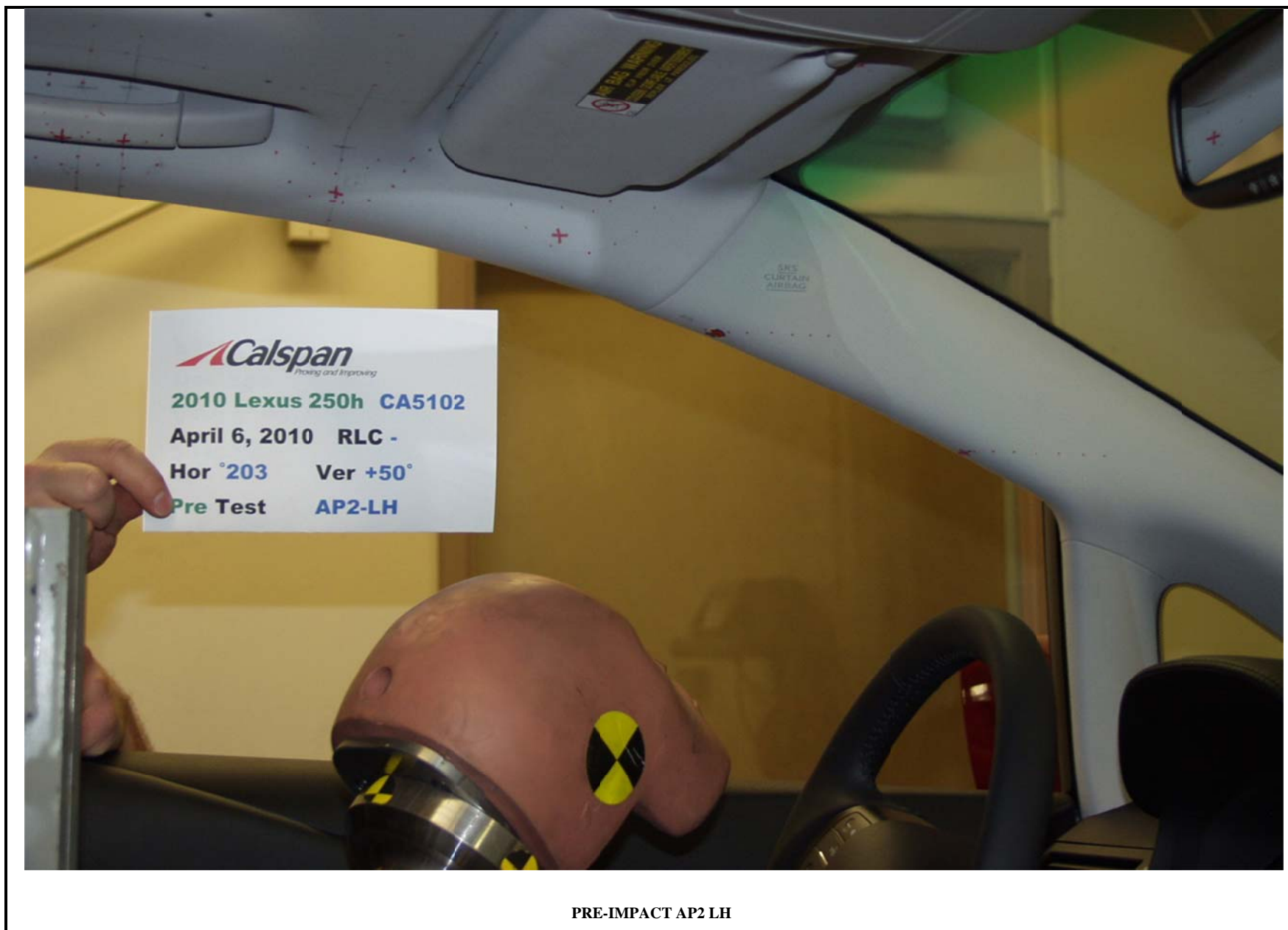
Headform Resultant

Max: 120.5 [g] at 0.010 [s]

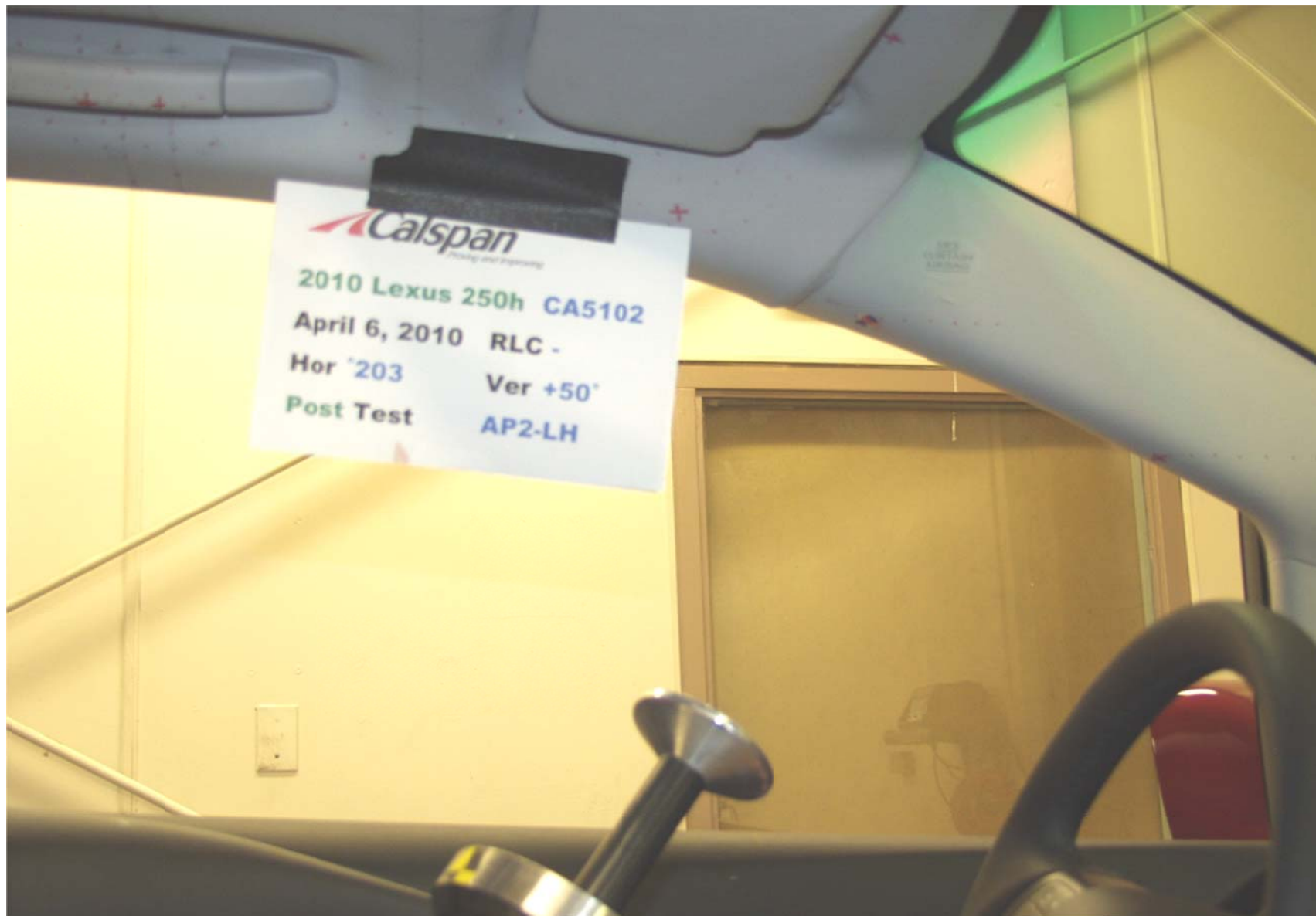
Min: 0.0 [g] at -0.079 [s]







PRE-IMPACT AP2 LH



POST-IMPACT AP2 LH

VEHICLE YEAR/MAKE/MODEL/STYLE:	2010 Lexus 250h
VIN:	JTHBB1BA5A2014110
DATE OF MANUFACTURE:	11/09 (SEE CERTIFICATION LABEL)
COLOR:	Red

Test Number:	11
Test Date:	6 April 2010
Target Location:	FH1 LH
Target Code:	FH1 LH
Horizontal Impact Angle:	180
Vertical Impact Angle:	50
Ambient Temperature:	21
Relative Humidity:	48.6%
Time of Impact:	4:15
Headform Number:	0062

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	-1	<input type="checkbox"/> mm right	<input checked="" type="checkbox"/> mm left
On Centerline	36	mm up	



POST-IMPACT FH1 LH HEADFORM

Free Motion HIC	295.8
HIC(d)	389.6
Impact Velocity (kph)	23.86
HIC T1 (msec)	3.0
HIC T2 (msec)	9.9

FH1 LH Side CA5102 - FH1 LH

FMH Headform 0062

Location: FH1 LH

Test Date: April 06, 2010

Work File: fmh

-----TEST RESULTS-----

Lab Temperature: 21 C

HICd: 389.6

Lab Humidity: 48.6 %

HIC (36ms): 295.8

Velocity at Impact: 23.86 KPH

t1: 3.0 msec

t2: 9.9 msec

Free Flight Distance: 231.95 mm

Duration: 6.9 msec

Maximum: 92.0 g

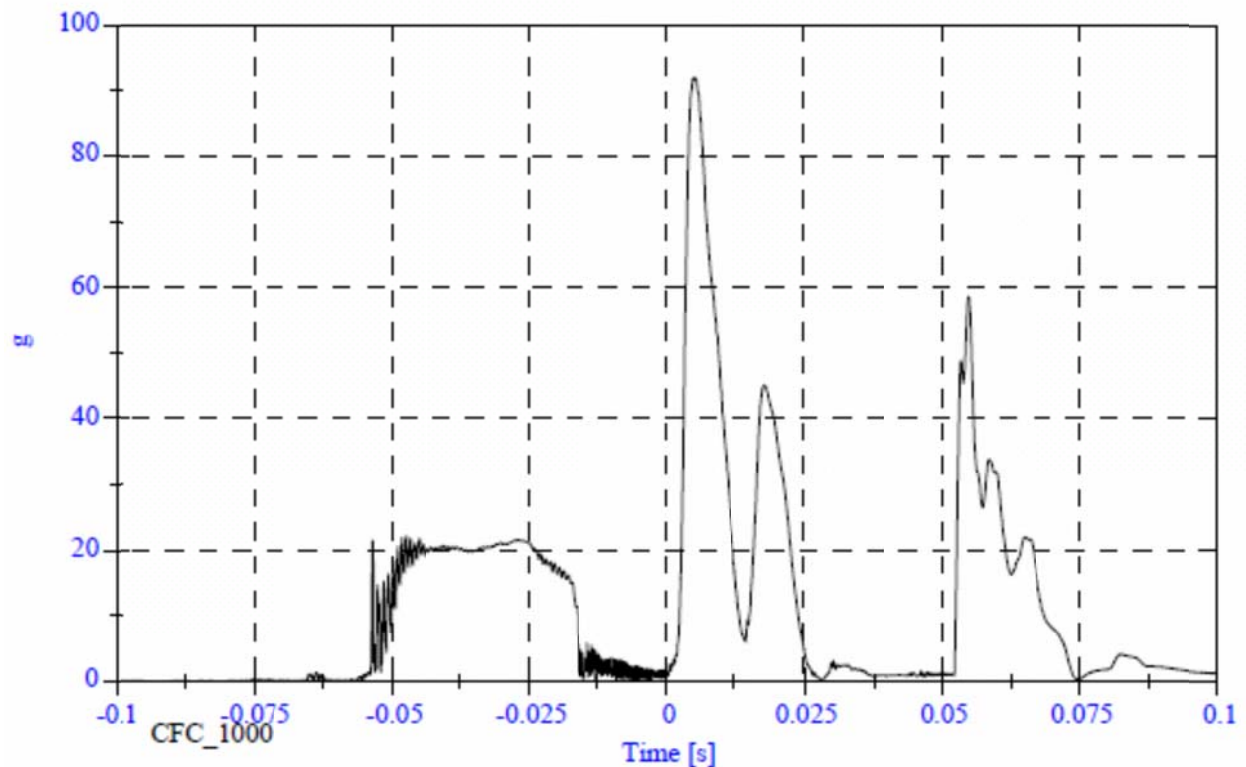
Average Acceleration: 11.0 g

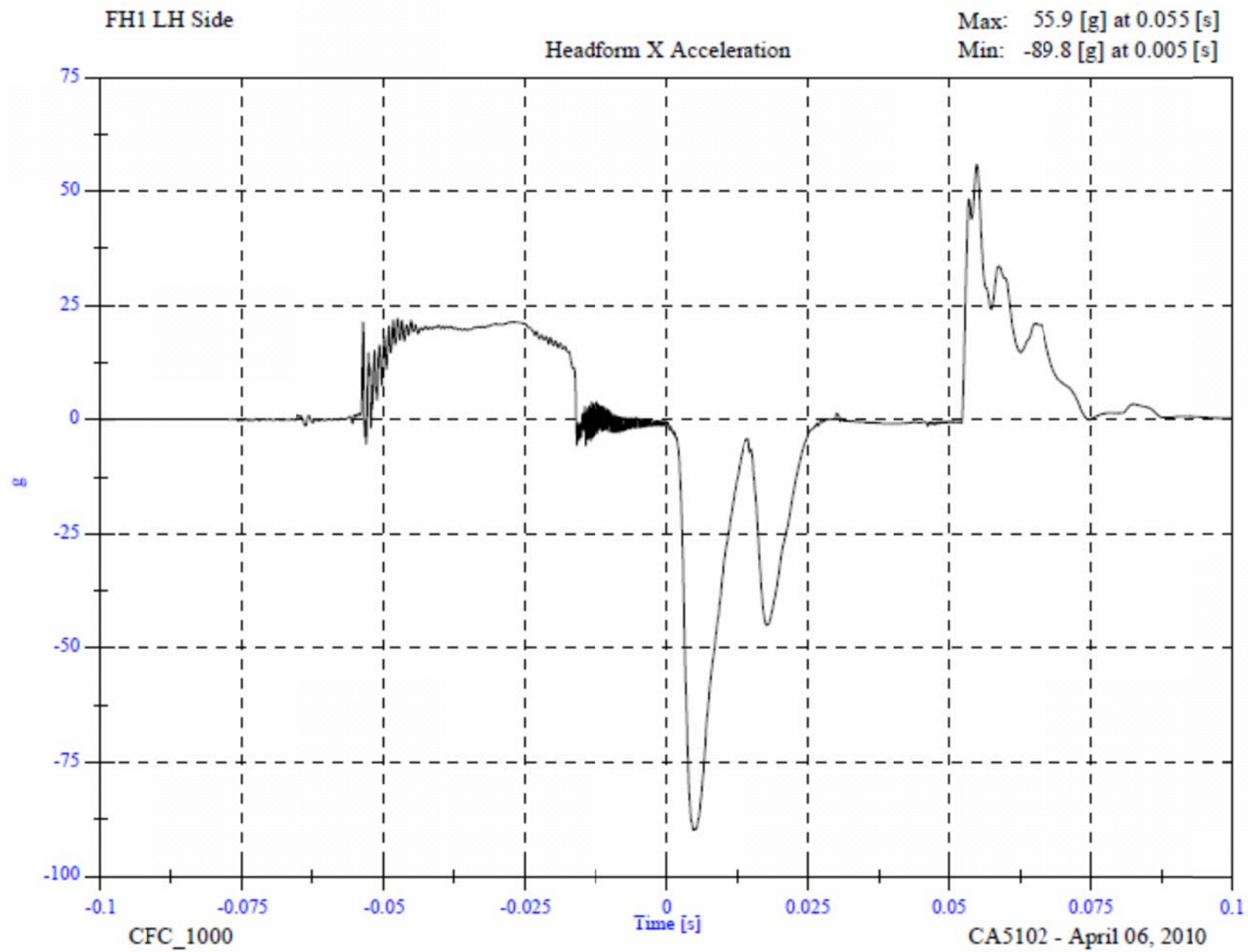
FH1 LH Side

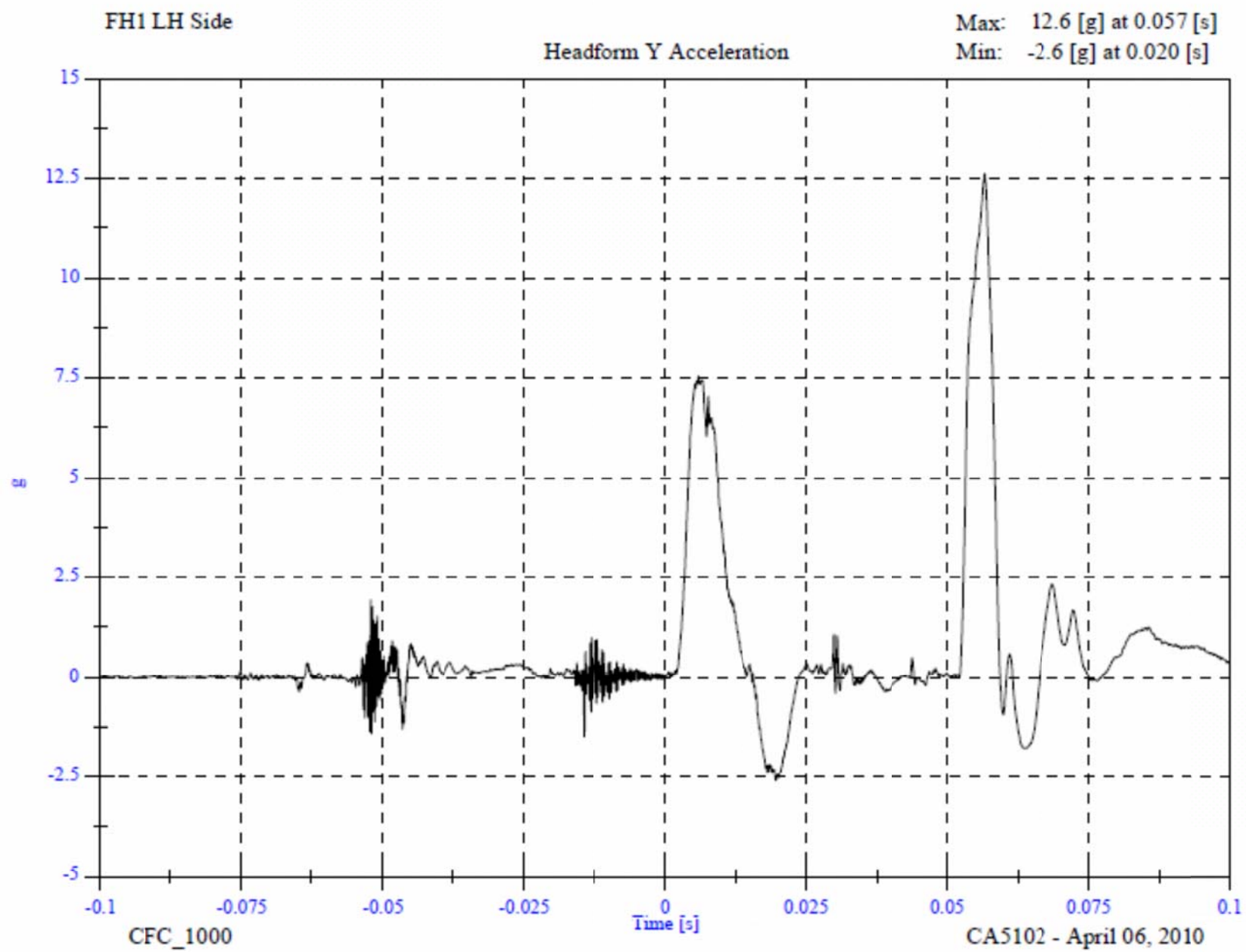
Headform Resultant

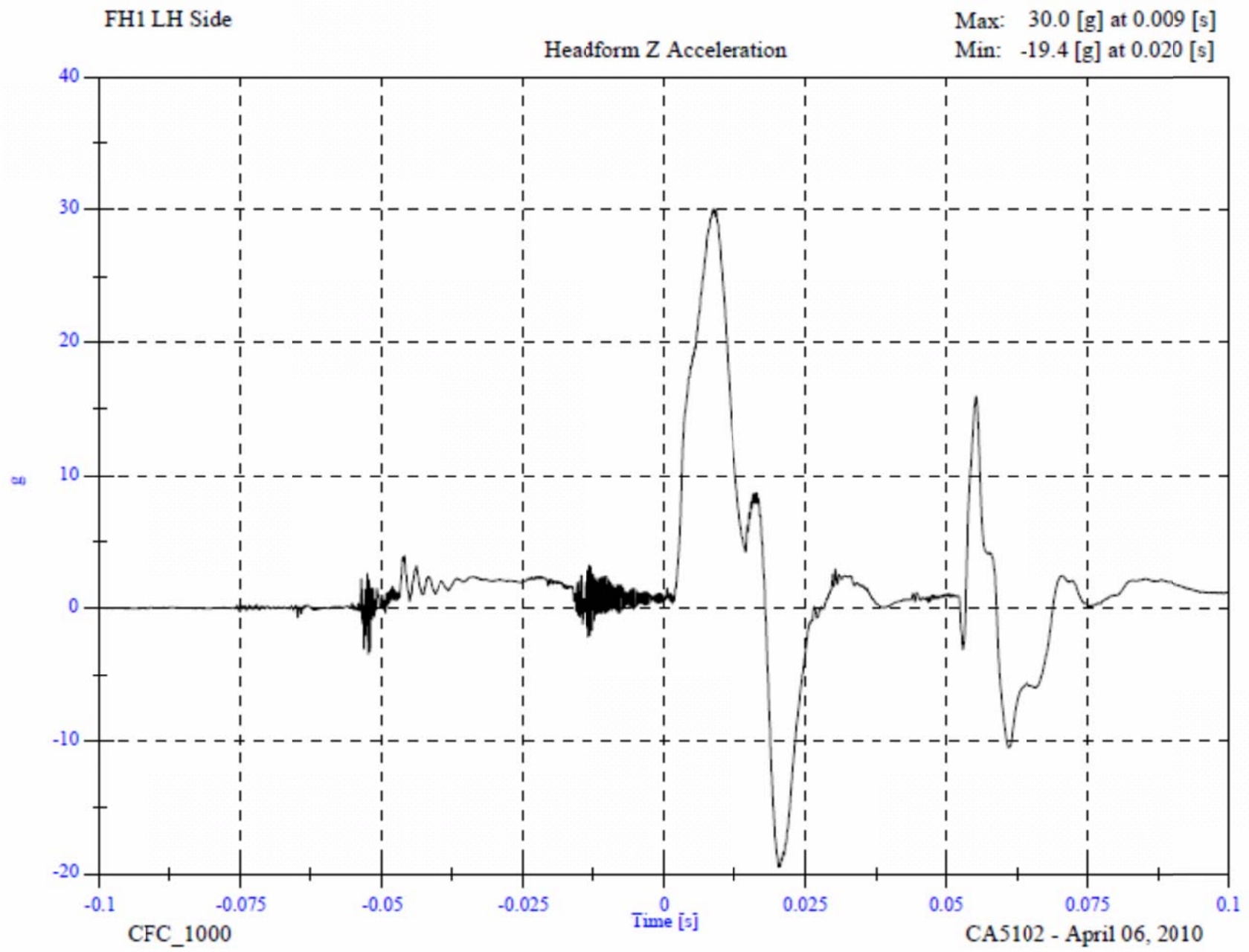
Max: 92.0 [g] at 0.005 [s]

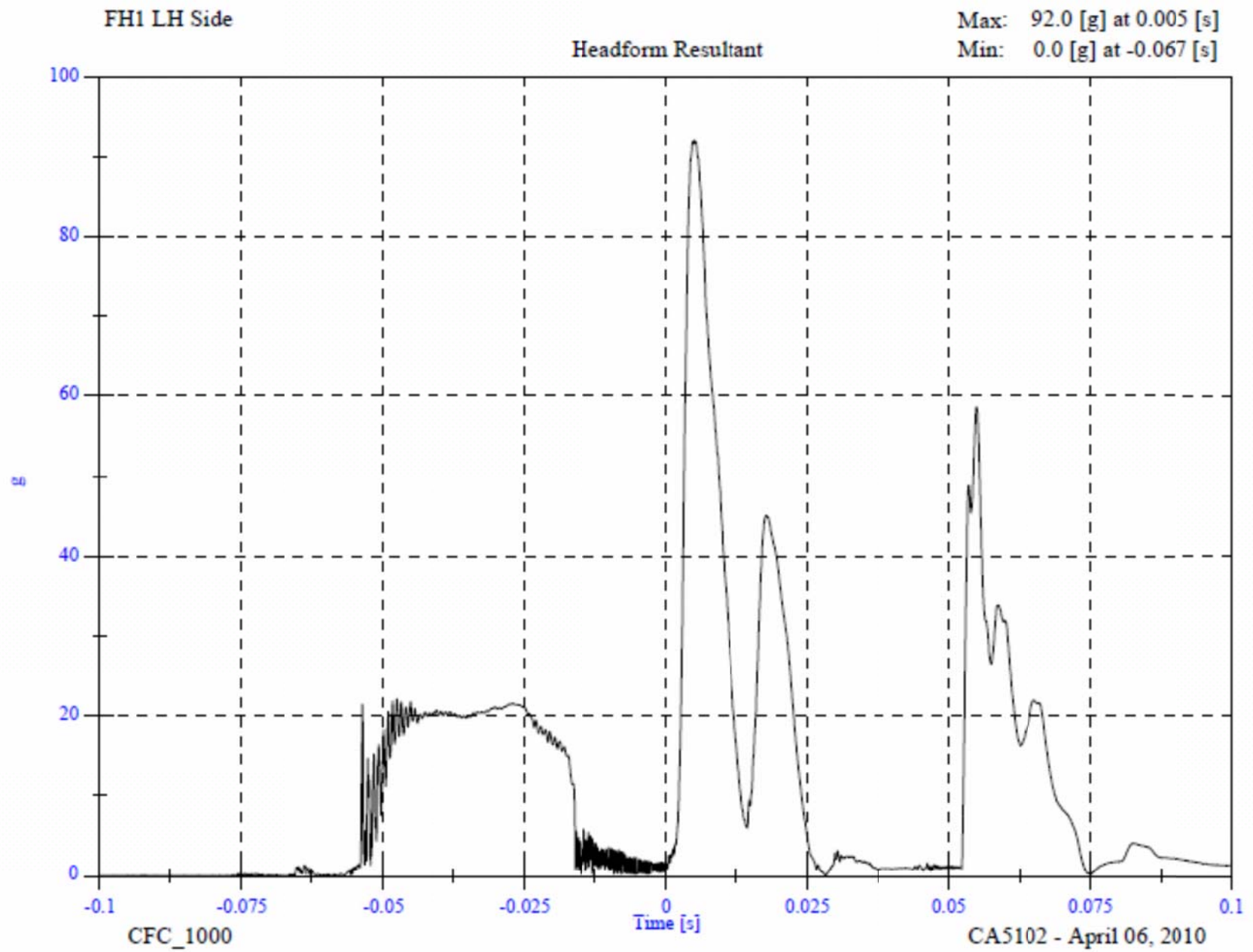
Min: 0.0 [g] at -0.067 [s]

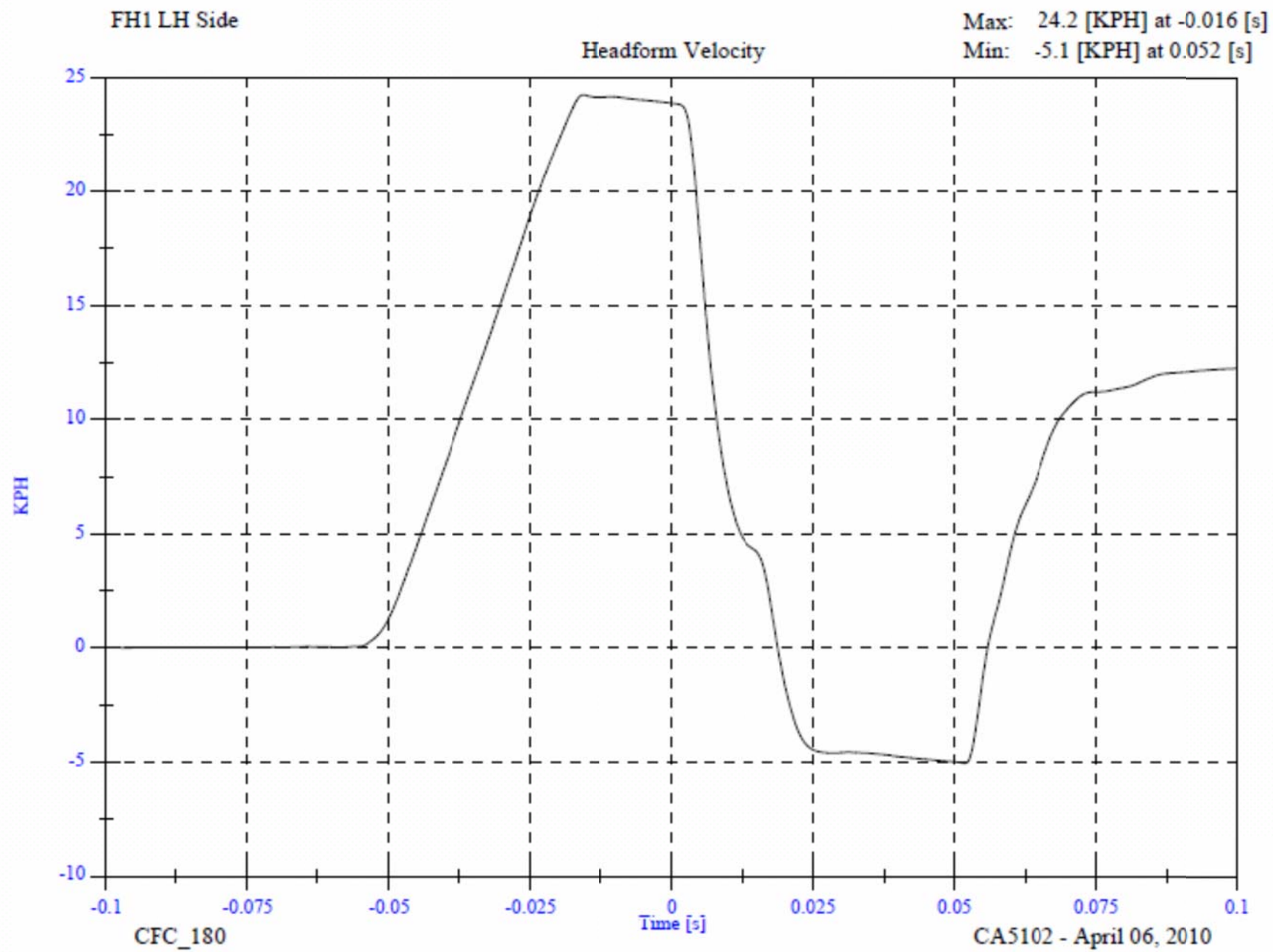














PRE-IMPACT FH1 LH



POST-IMPACT FH1 LH

VEHICLE YEAR/MAKE/MODEL/STYLE:	2010 Lexus 250h
VIN:	JTHBB1BA5A2014110
DATE OF MANUFACTURE:	11/09 (SEE CERTIFICATION LABEL)
COLOR:	Red

Test Number:	12
Test Date:	6 April 2010
Target Location:	SR1 LH
Target Code:	SR1 LH
Horizontal Impact Angle:	270
Vertical Impact Angle:	38
Ambient Temperature:	21
Relative Humidity:	48.7%
Time of Impact:	4:48
Headform Number:	0355

Impact Point Description (from lower midpoint on midsagittal line)				
On Centerline	15	<input checked="" type="checkbox"/>	mm right	<input type="checkbox"/> mm left
On Centerline	55		mm up	



POST-IMPACT SR1 LH HEADFORM

Free Motion HIC	437.1
HIC(d)	496.1
Impact Velocity (kph)	18.43
HIC T1 (msec)	7.0
HIC T2 (msec)	11.4

SR1 LH Side CA5102 - SR1 LH

FMH Headform 0355

Location: SR1 LH

Test Date: April 06, 2010

Work File: fmh

-----TEST RESULTS-----

Lab Temperature: 21 C

HICd: 496.1

Lab Humidity: 48.7 %

HIC (36ms): 437.1

Velocity at Impact: 18.42 KPH

t1: 7.0 msec

t2: 11.4 msec

Free Flight Distance: 239.25 mm

Duration: 4.4 msec

Maximum: 122.3 g

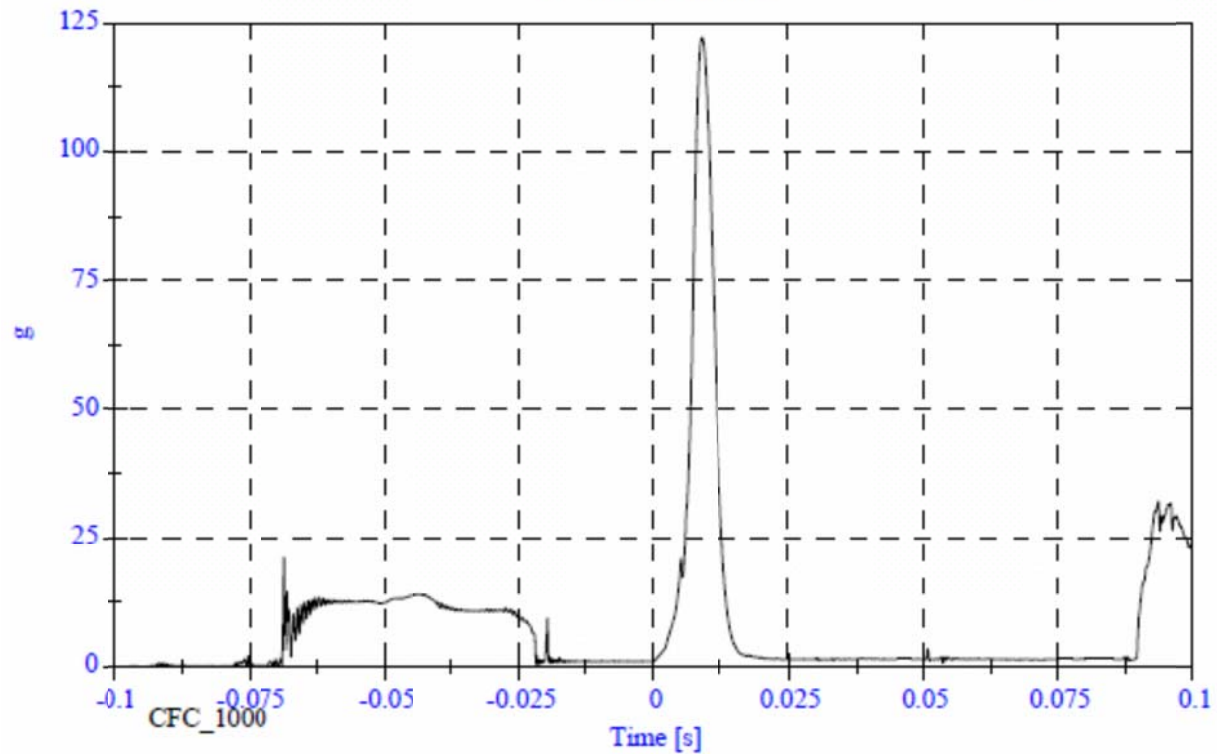
Average Acceleration: 7.9 g

SR1 LH Side

Headform Resultant

Max: 122.3 [g] at 0.009 [s]

Min: 0.0 [g] at -0.082 [s]

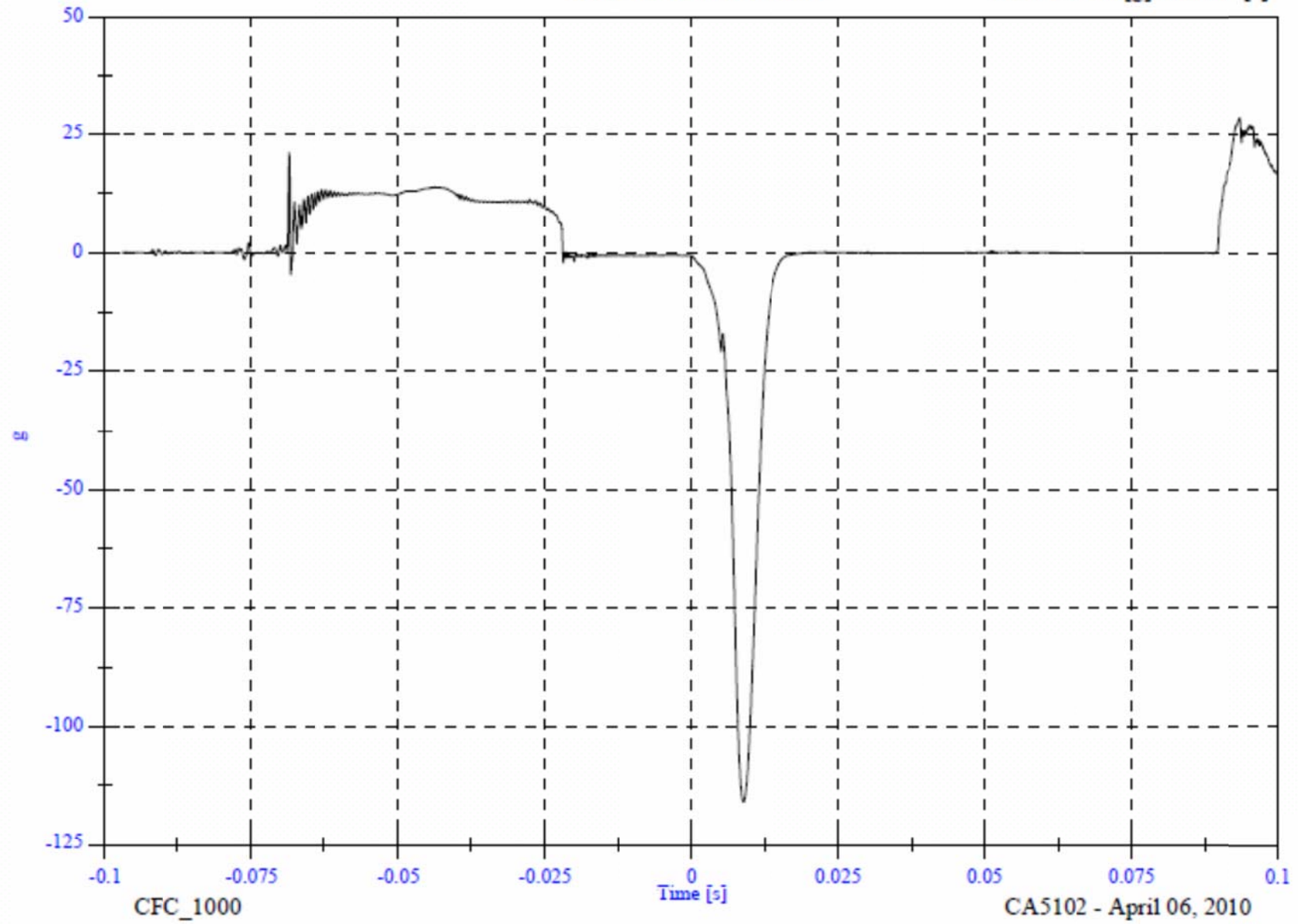


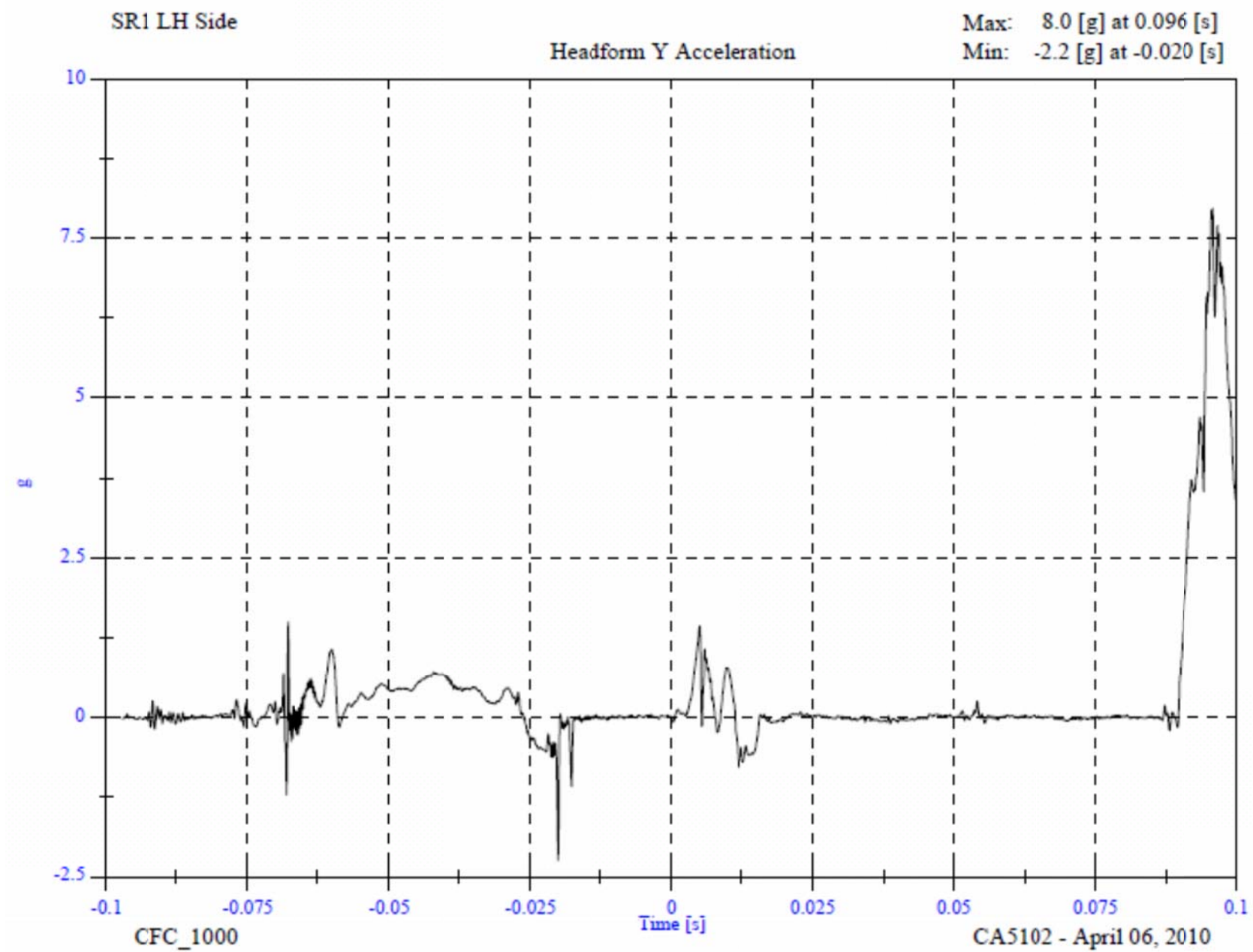
SR1 LH Side

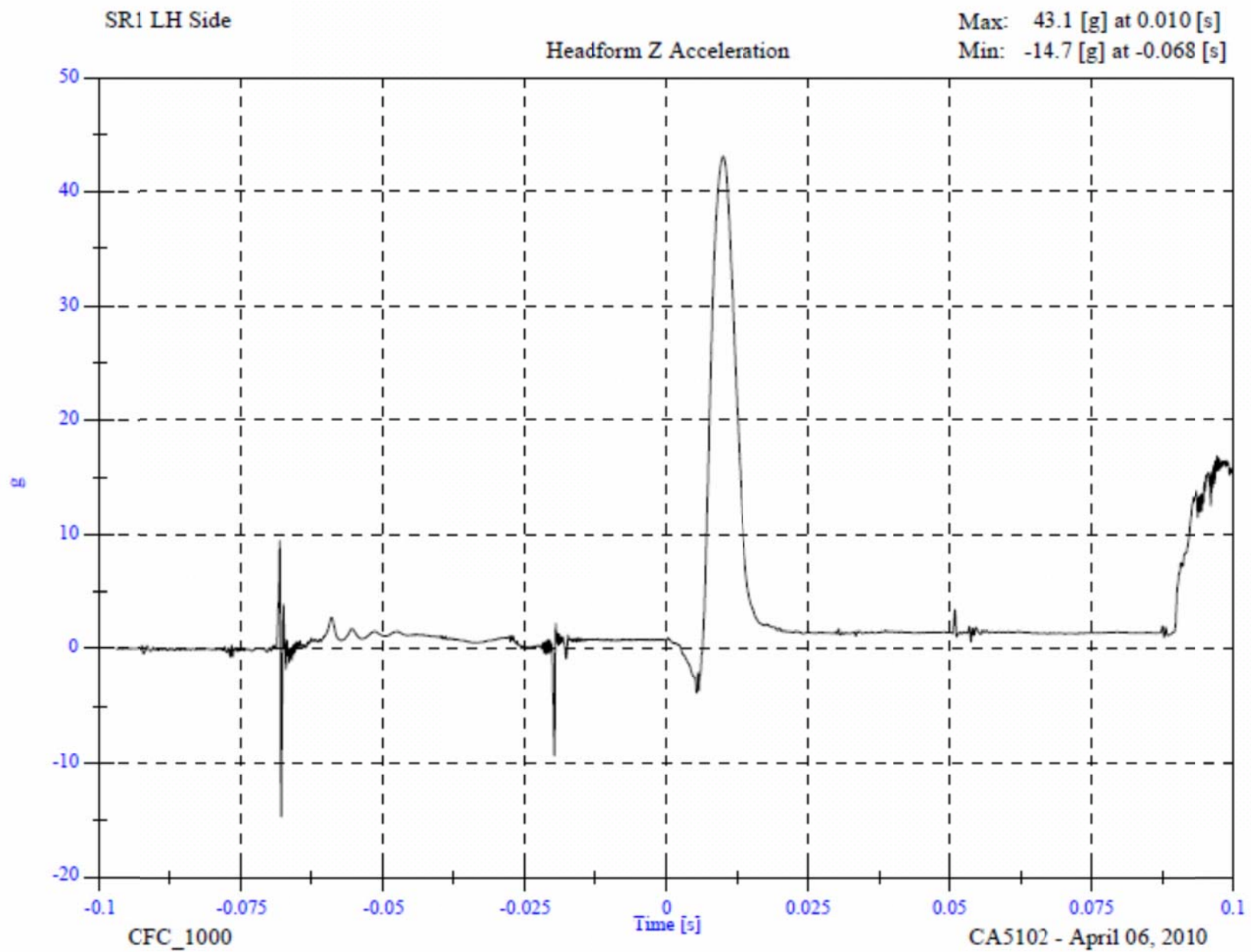
Headform X Acceleration

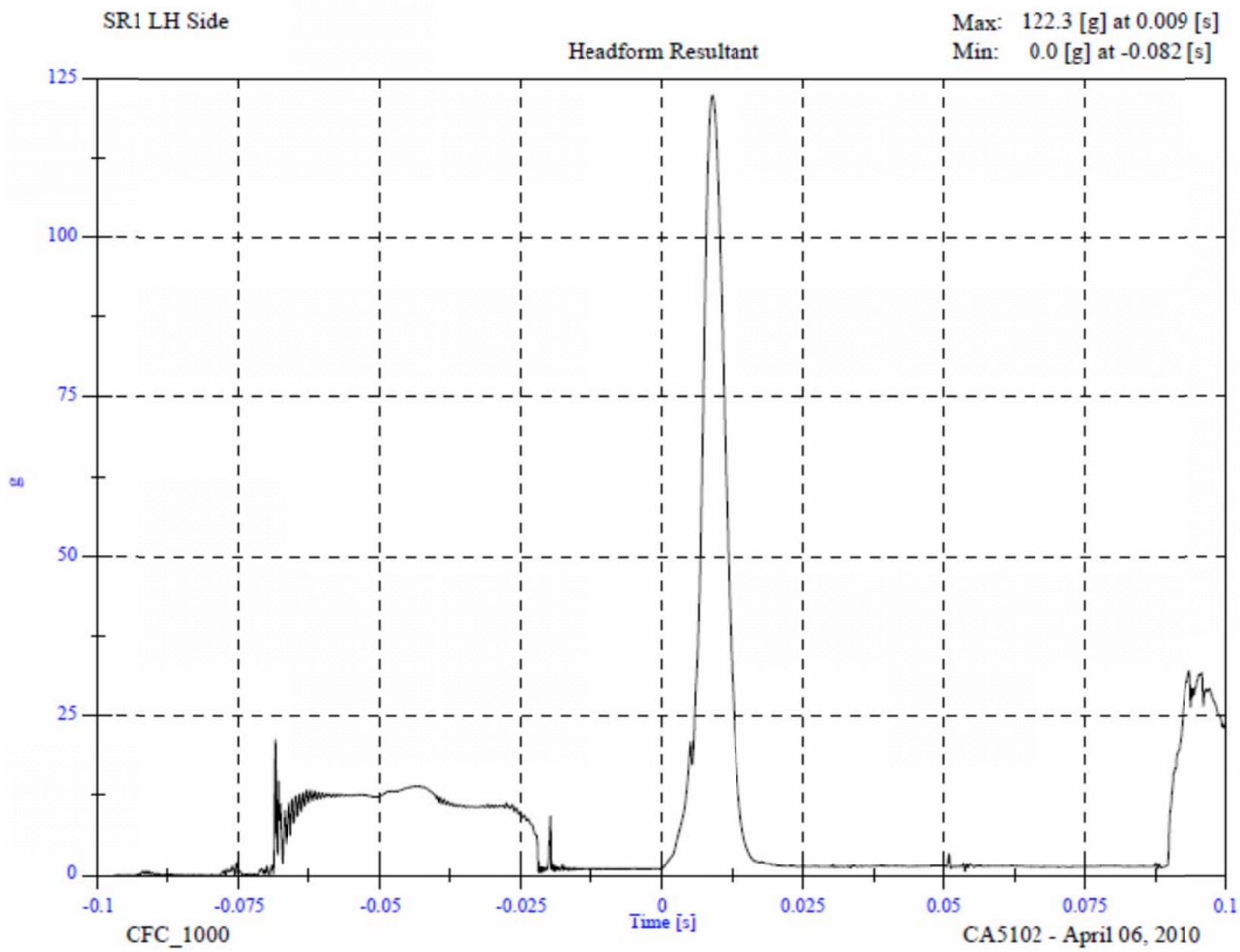
Max: 28.6 [g] at 0.094 [s]

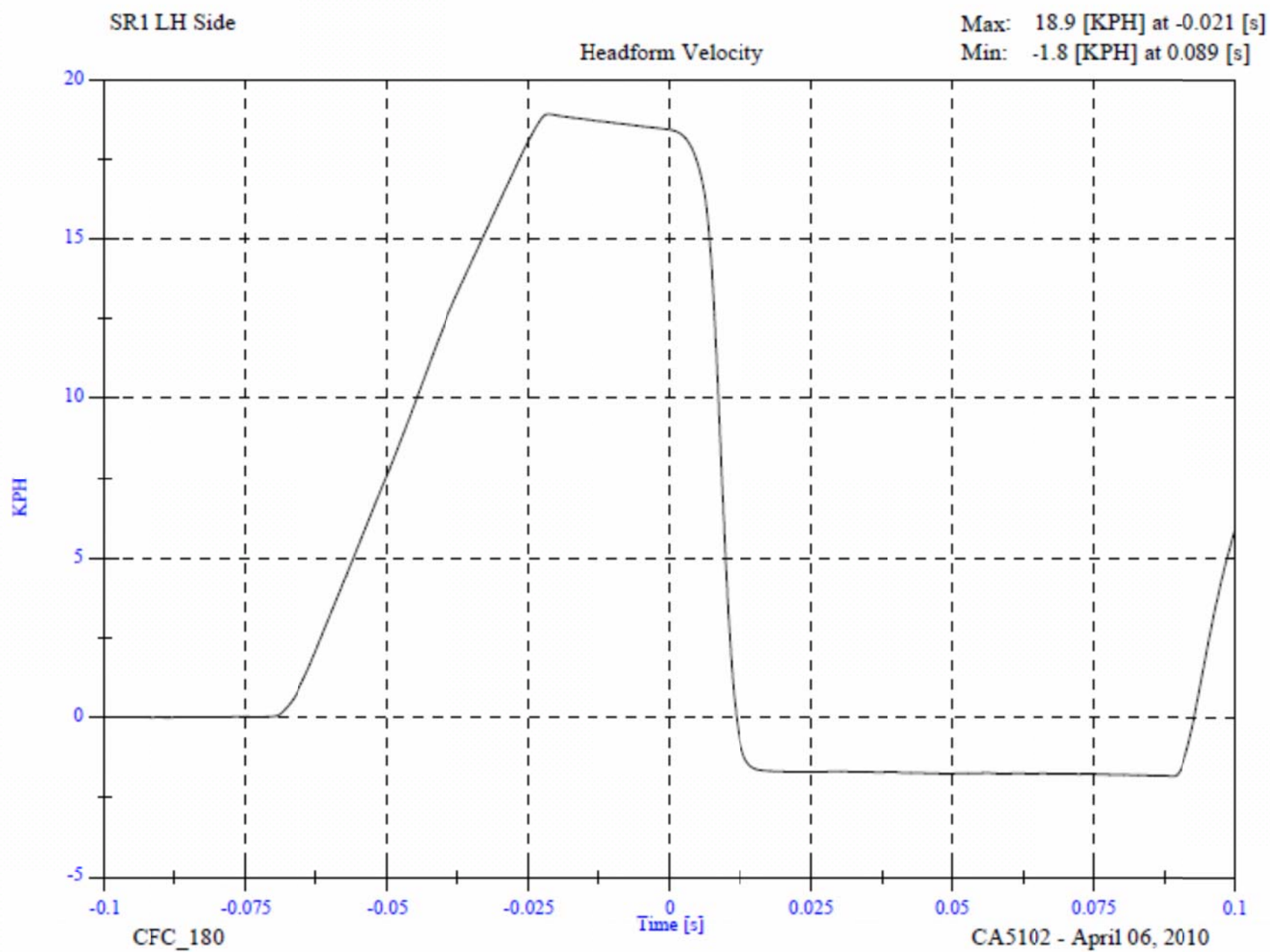
Min: -115.9 [g] at 0.009 [s]













PRE-IMPACT SR1 LH



POST-IMPACT SR1 LH

APPENDIX A

PHOTOGRAPHS

PHOTOGRAPHS

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A-21	POST-TEST DRIVER SIDE SIDE RAIL	A-23
A-22	POST-TEST DRIVER SIDE B-PILLAR	A-24
A-23	POST-TEST DRIVER SIDE OTHER PILLAR	A-25
A-24	POST-TEST DRIVER SIDE REAR PILLAR	A-26
A-25	POST-TEST PASSENGER SIDE A-PILLAR	A-27
A-26	POST-TEST PASSENGER SIDE FRONT HEADER	A-28
A-27	POST-TEST PASSENGER SIDE SIDE RAIL	A-29
A-28	POST-TEST PASSENGER SIDE B-PILLAR	A-30
A-29	POST-TEST PASSENGER SIDE OTHER PILLAR	A-31
A-30	POST-TEST PASSENGER SIDE REAR PILLAR	A-32



Figure A-1 : LEFT SIDE VIEW OF VEHICLE



Figure A-2 : RIGHT SIDE VIEW OF VEHICLE



Figure A-3 : 3/4 FRONTAL VIEW FROM LEFT SIDE OF VEHICLE



Figure A-4 : 3/4 REAR VIEW FROM RIGHT SIDE OF VEHICLE



Figure A-5 : VEHICLE'S CERTIFICATION LABEL



Figure A-6 : VEHICLE'S TIRE INFORMATION LABEL

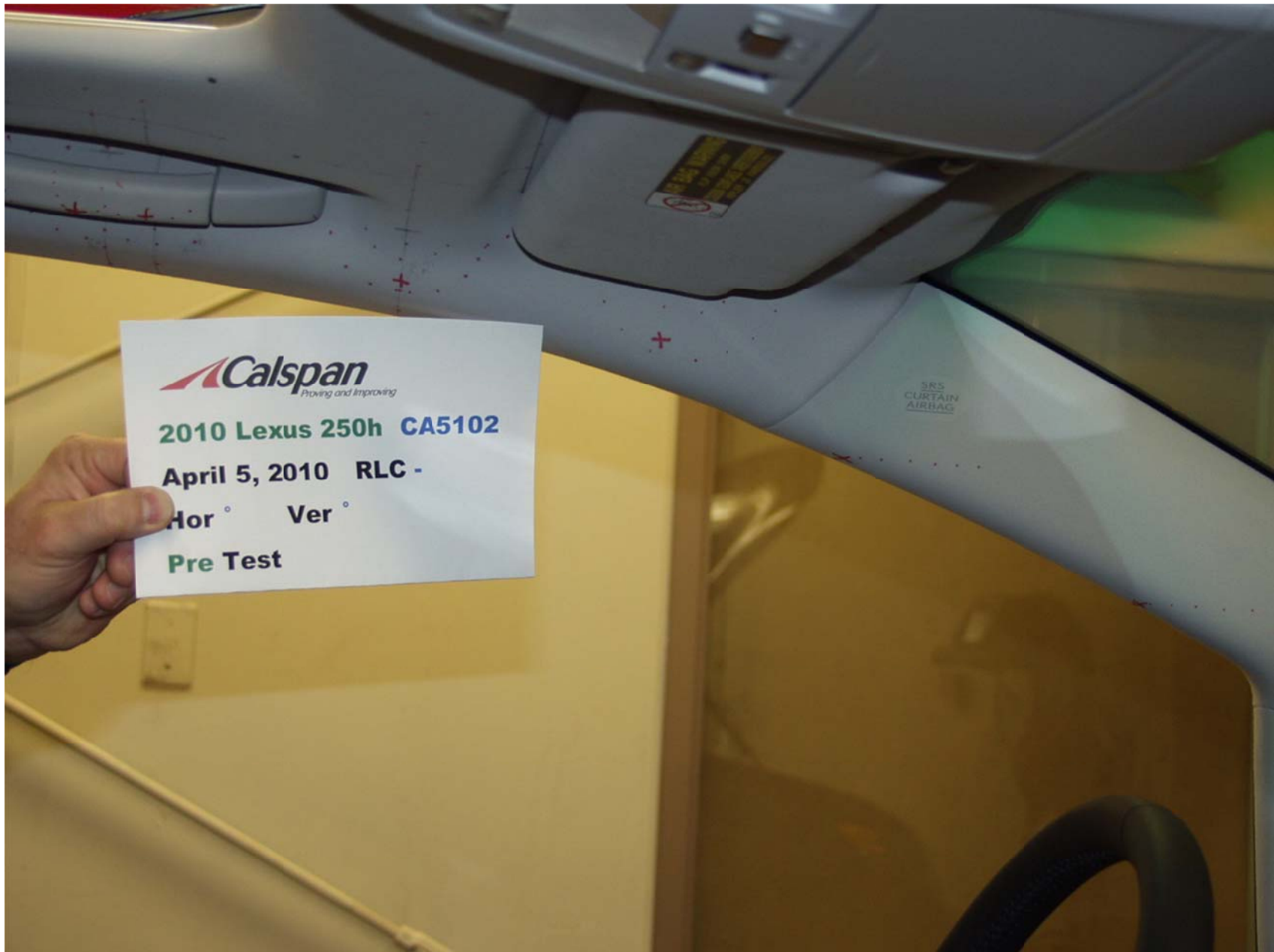


Figure A-7 : PRE-TEST DRIVER SIDE A-PILLAR

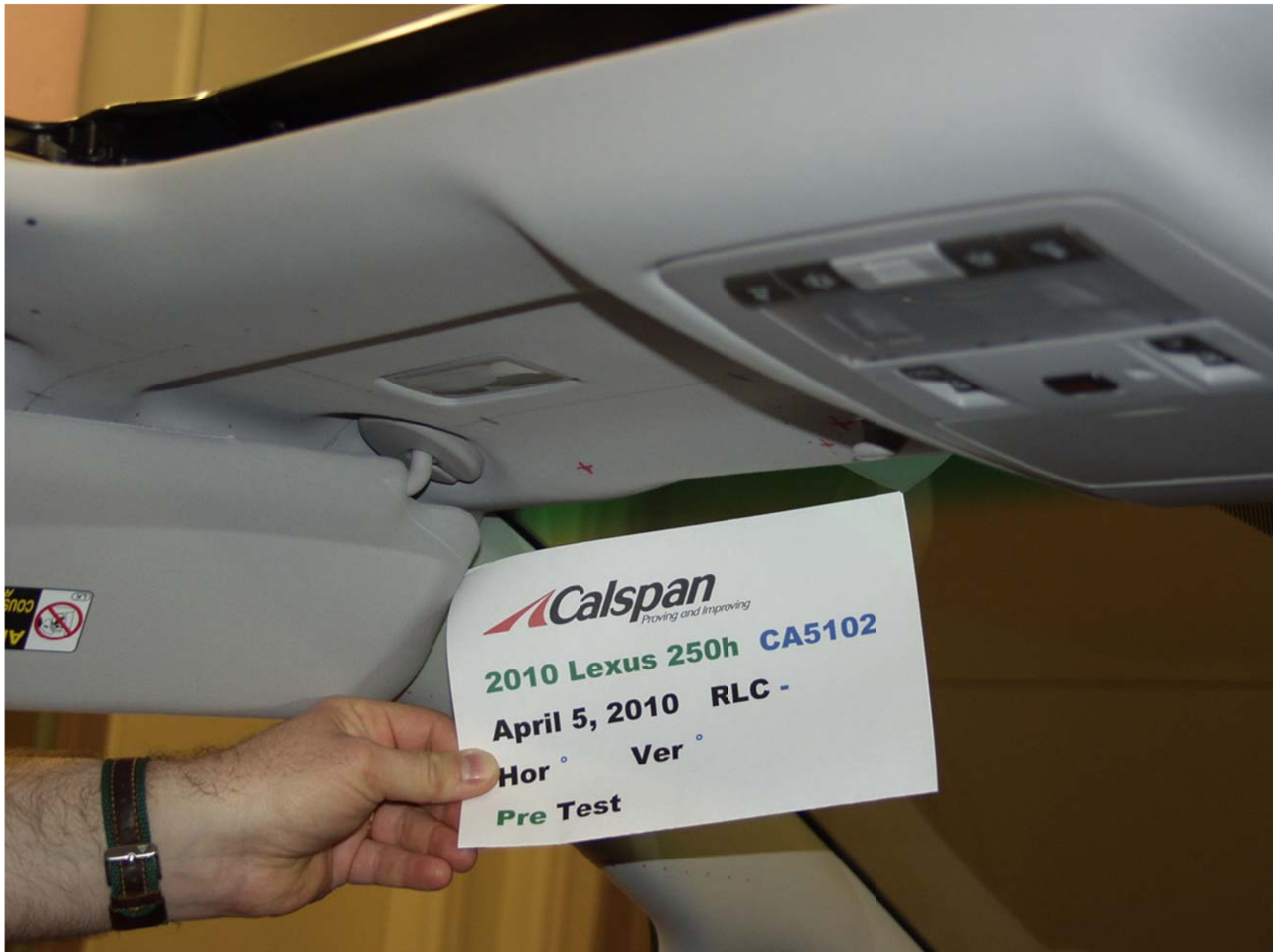


Figure A-8 : PRE-TEST DRIVER SIDE FRONT HEADER



Figure A-9 : PRE-TEST DRIVER SIDE SIDE RAIL



Figure A-10 : PRE-TEST DRIVER SIDE B-PILLAR

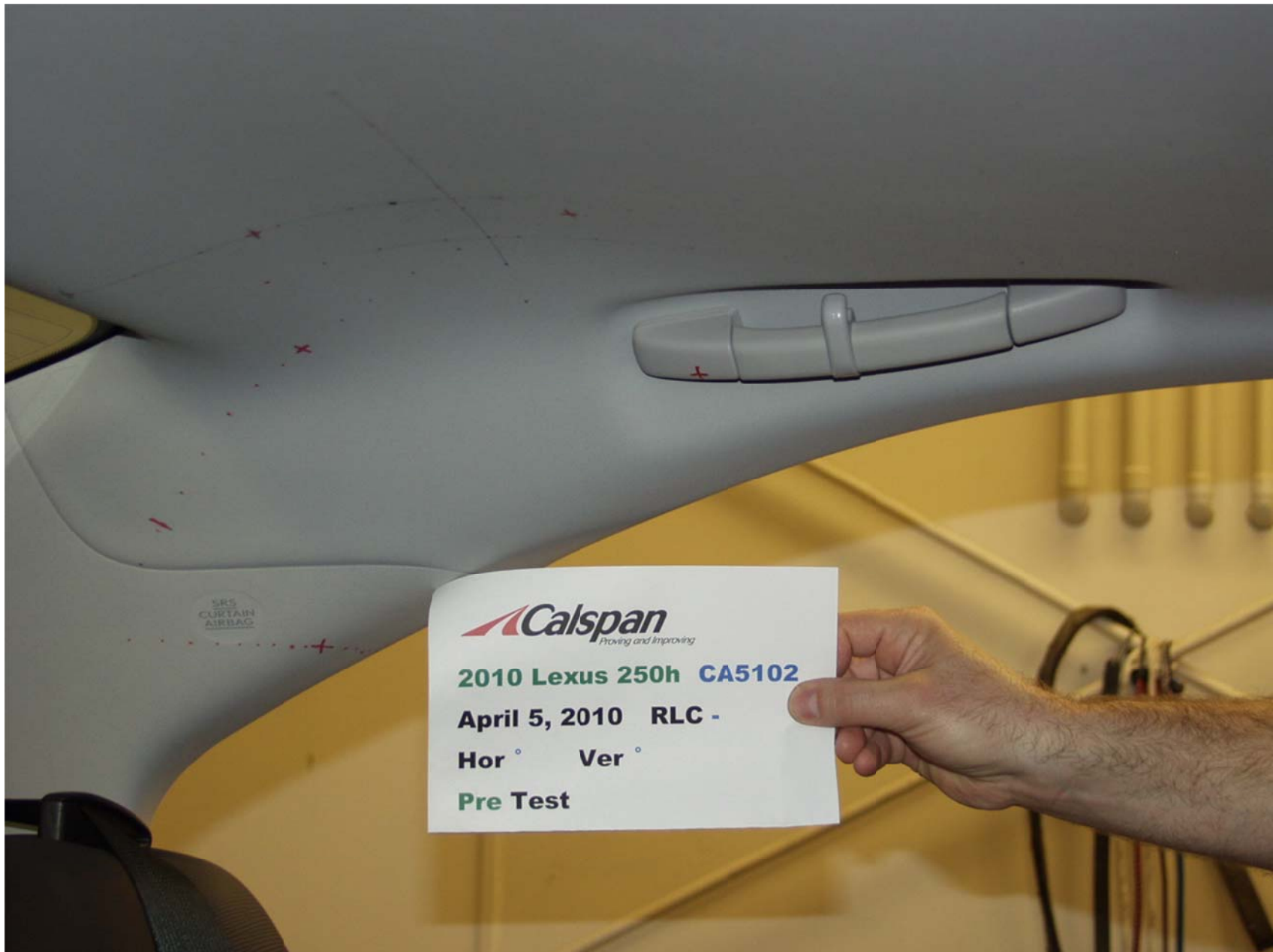


Figure A-11 : PRE-TEST DRIVER SIDE REAR PILLAR



Figure A-12 : PRE-TEST PASSENGER SIDE A-PILLAR



Figure A-13 : PRE-TEST PASSENGER SIDE FRONT HEADER



Figure A-14 : PRE-TEST PASSENGER SIDE SIDE RAIL



Figure A-15 : PRE-TEST PASSENGER SIDE B-PILLAR

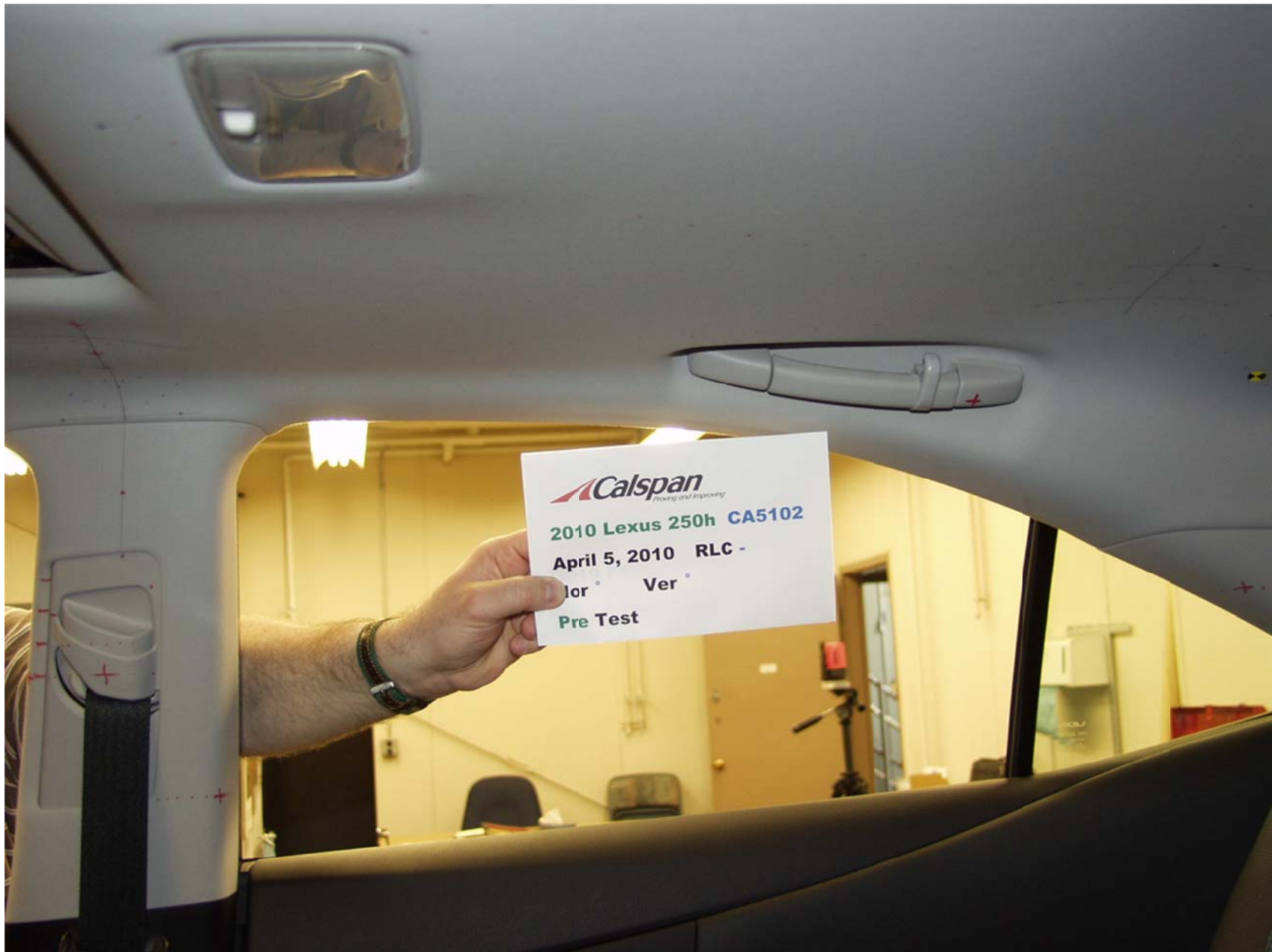


Figure A-16 : PRE-TEST PASSENGER SIDE REAR PILLAR



Figure A-17 : POST-TEST DRIVER SIDE A-PILLAR

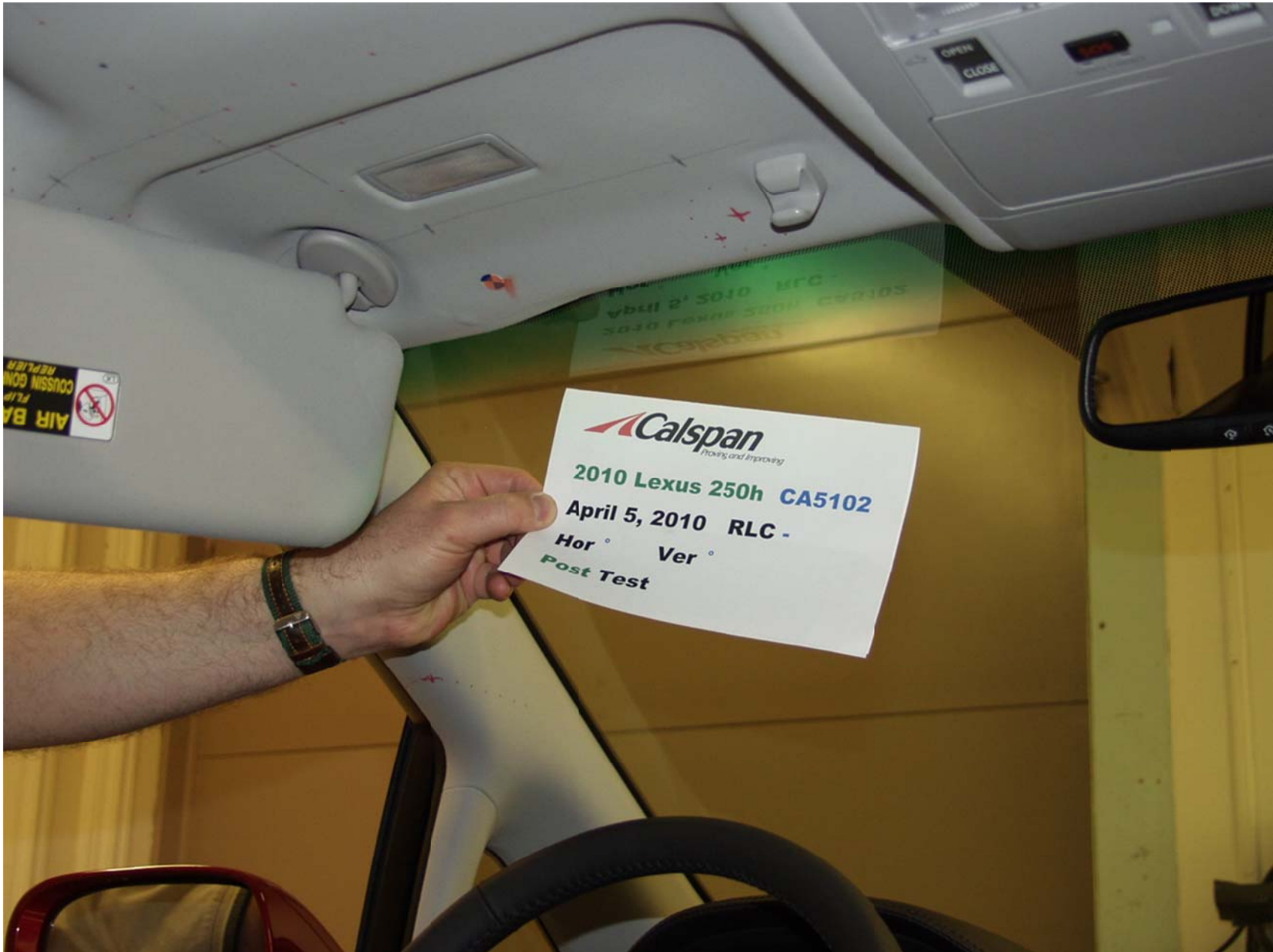


Figure A-18 : POST-TEST DRIVER SIDE FRONT HEADER

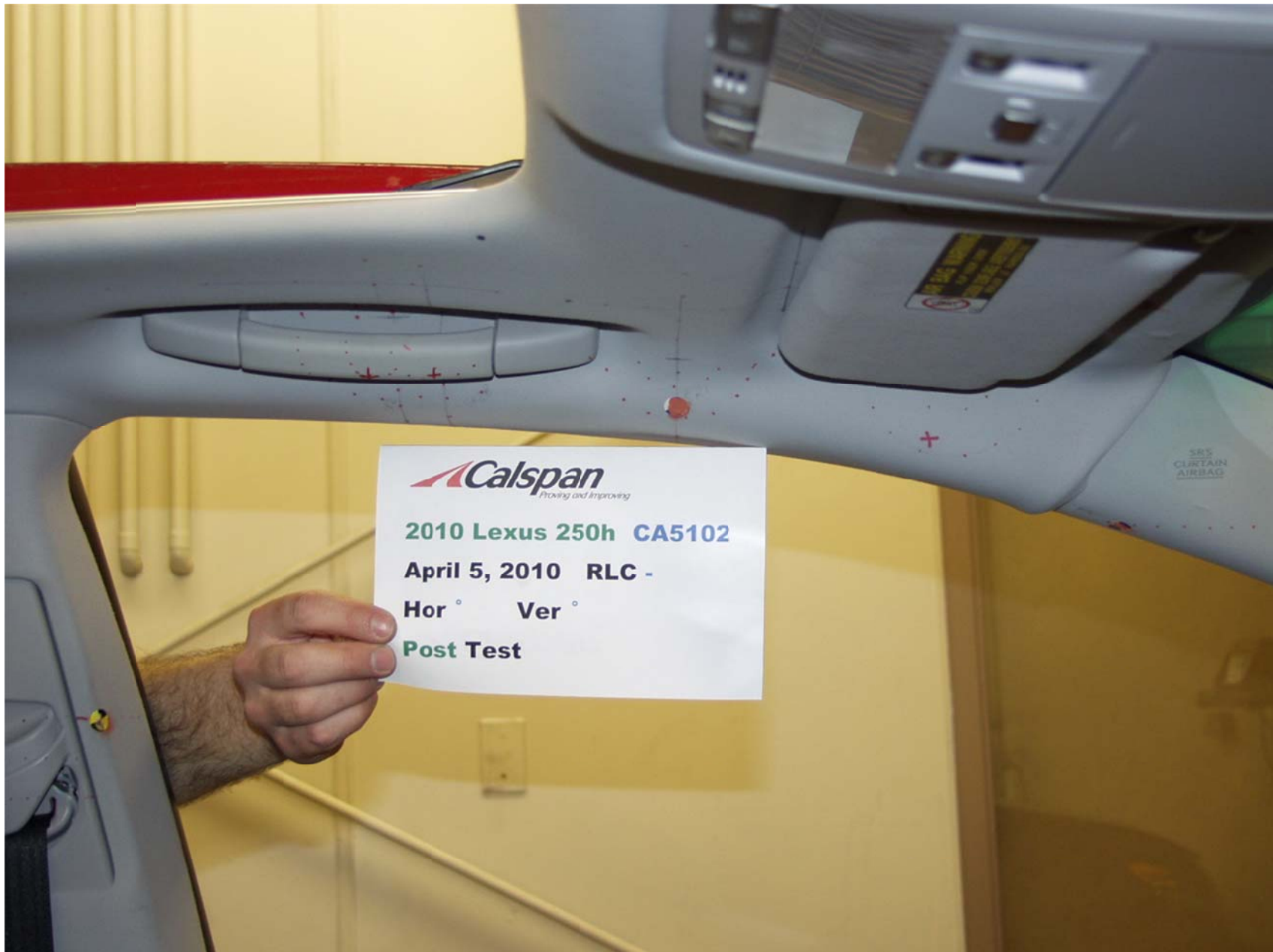


Figure A-19 : POST-TEST DRIVER SIDE SIDE RAIL

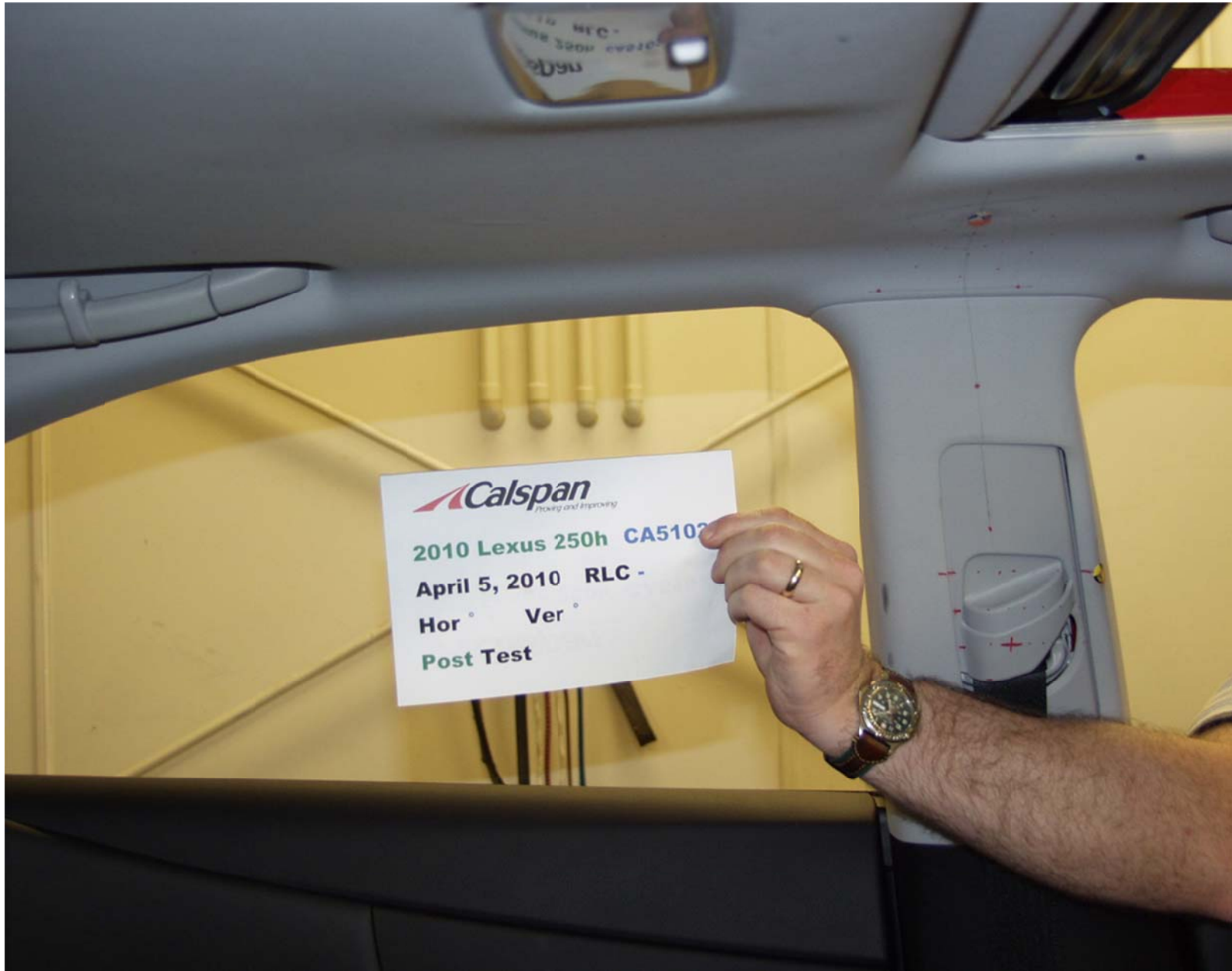


Figure A-20 : POST-TEST DRIVER SIDE B-PILLAR



Figure A-21 : POST-TEST DRIVER SIDE REAR PILLAR



Figure A-22 : POST-TEST PASSENGER SIDE A-PILLAR



Figure A-23 : POST-TEST PASSENGER SIDE FRONT HEADER



Figure A-24 : POST-TEST PASSENGER SIDE SIDE RAIL

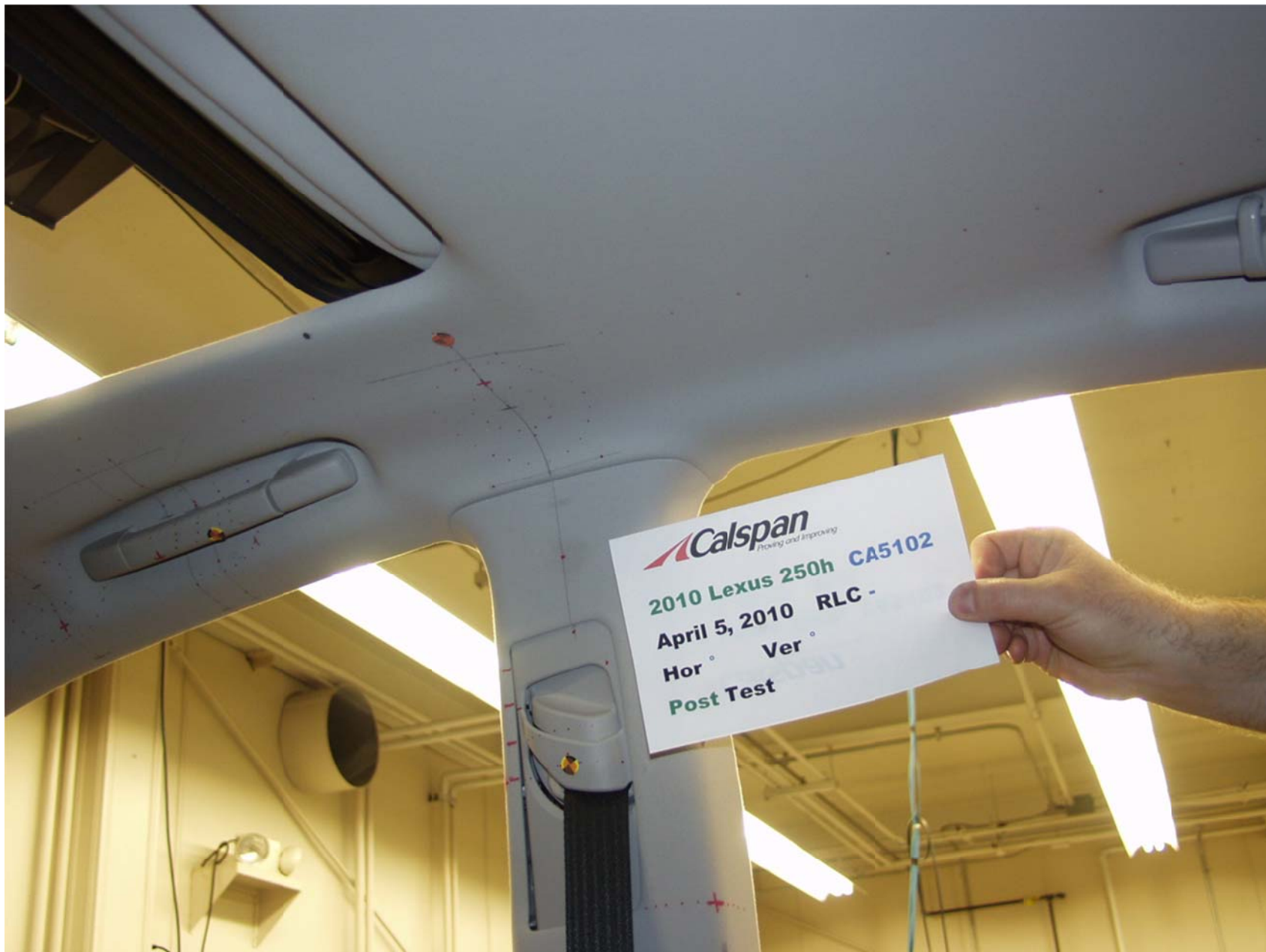


Figure A-25 : POST-TEST PASSENGER SIDE B-PILLAR



Figure A-26 : POST-TEST PASSENGER SIDE REAR PILLAR

APPENDIX B

PART 572L PERFORMANCE CALIBRATION IN SUPPORT OF VEHICLE SAFETY COMPLIANCE TESTING FOR OCCUPANT PROTECTION IN INTERIOR IMPACT

Appendix B contains the results from certification tests performed on the Free Motion Headforms utilized in this test program. The results indicate that the headforms meet all of the performance specifications given in 49 CFR Part 572 Subpart L.

The tests were conducted at the Dummy Certification Test Facility of Calspan Corporation. A summary of the test results are included in this Appendix.

**PART 572L
HEAD DROP PRE-TEST**

MANUFACTURER:		FIRST TECHNOLOGY SAFETY SYSTEMS	
SERIAL NUMBER:		0062	
CALIBRATION DATE:		March 31, 2010	
TEST PARAMETER	SPECIFICATION		TEST RESULTS
TEMPERATURE	19°C to 26°C		21 °C
RELATIVE HUMIDITY	10% to 70%		28%
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs		251.7 Gs
PEAK LATERAL ACCELERATION	15 Gs Maximum		1.4 Gs
IS ACCELERATION CURVE UNIMODAL?	YES		YES

HEAD ACCELEROMETER CALIBRATION INFORMATION

I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 -LONGITUDINAL	ENDEVCO	7264-2000T	J45546	3/30/2010	9/30/2010
2 - LATERAL	ENDEVCO	7264-2000T	J45485	3/30/2010	9/30/2010
3 - VERTICAL	ENDEVCO	7264-2000T	J45406	3/30/2010	9/30/2010

REMARKS:

FMVSS 201U - Headform Calibration Drops

Part 572E Head Drop

Calibration Date: March 31, 2010

Serial No: 0062

Work File: fmh

-----TEST RESULTS-----

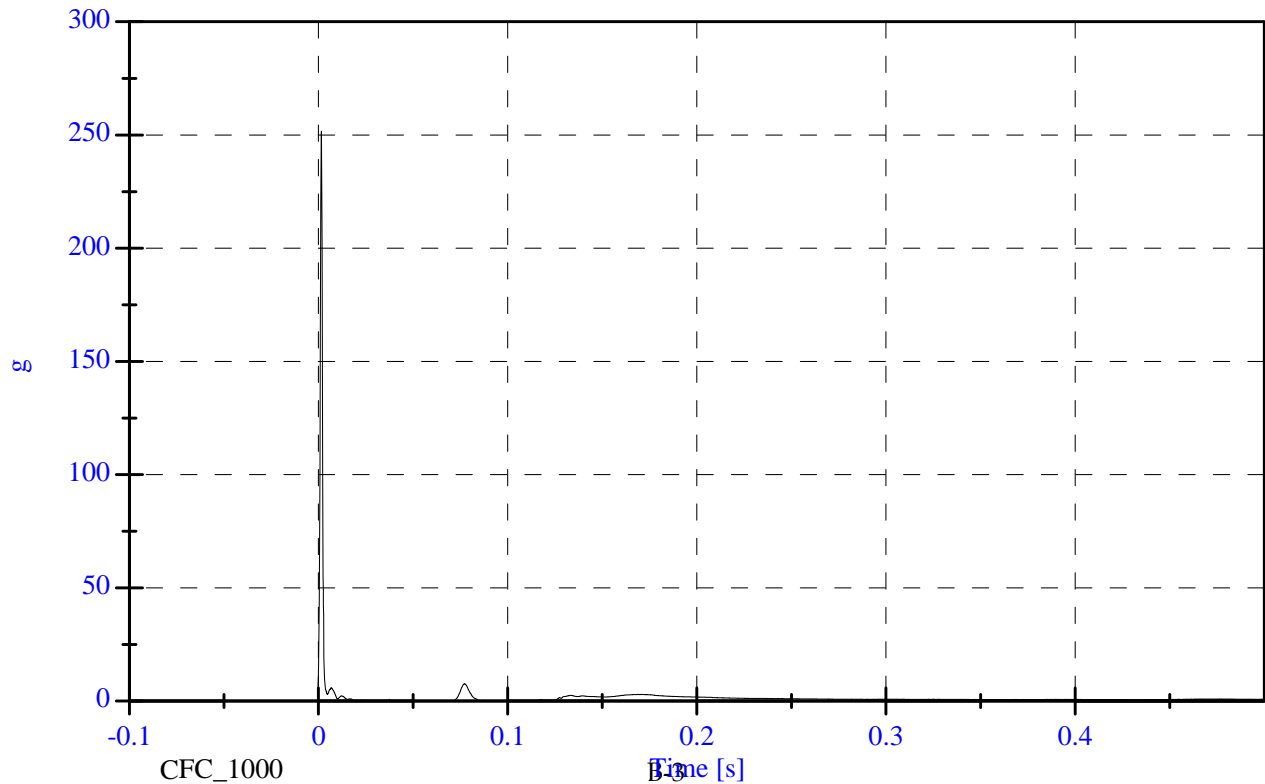
<u>TEST CONDITION</u>	<u>PARAMETERS</u>	<u>RESULTS</u>	<u>STATUS</u>
Lab Temperature:	19-26 C	21.1	Passed
Lab Humidity	10-70 %	28.00 %	Passed
Peak Resultant Accel.:	225-275 Gs	251.72 Gs	Passed
Peak Lateral Accel.:	15 Gs Max	1.35 Gs	Passed
Curve Percent NonModal:	< 10%	3.02 %	Passed

FMVSS 201U - Headform Calibration Drops

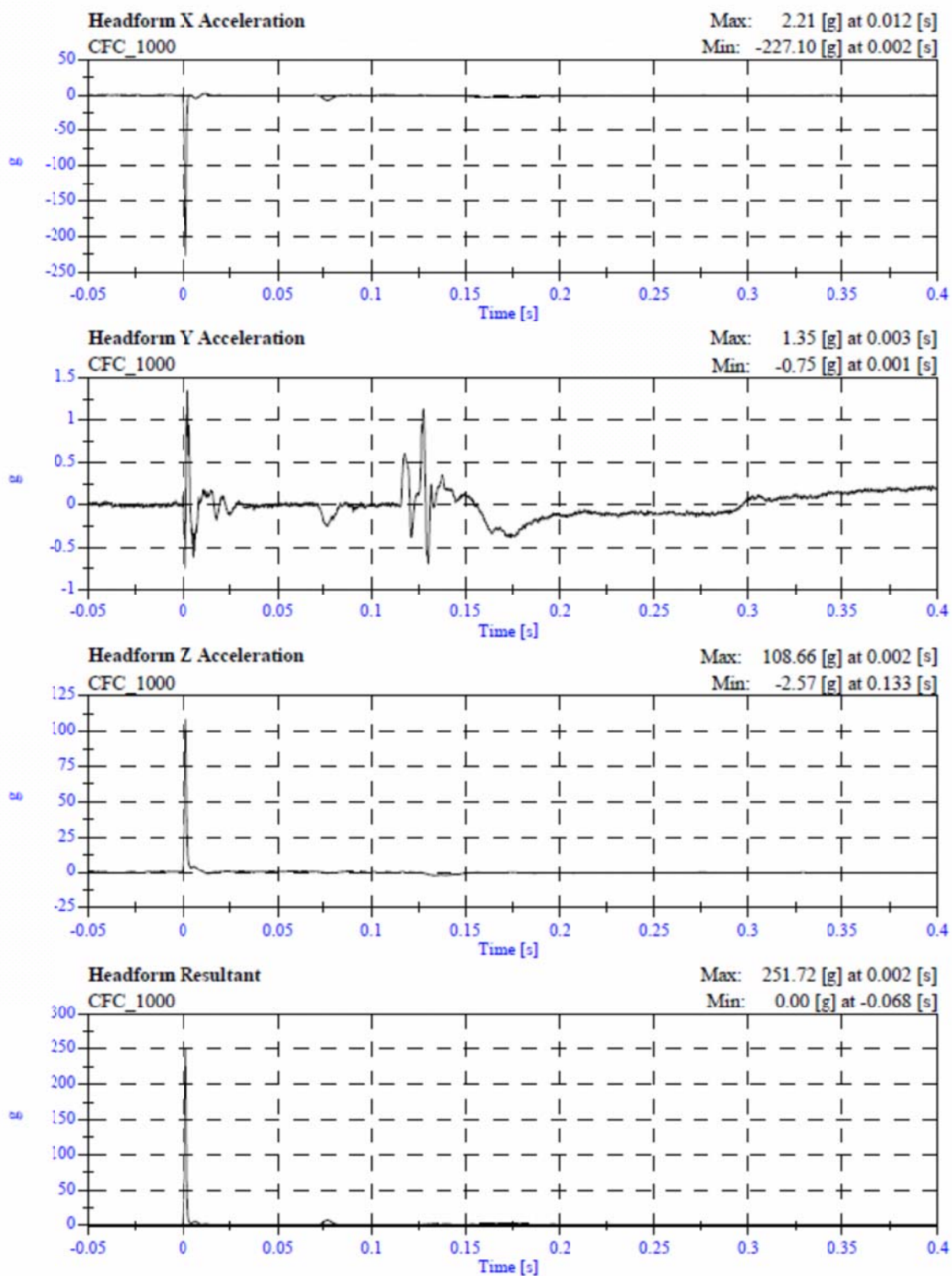
Headform Resultant

Max: 251.7 [g] at 0.001 [s]

Min: 0.0 [g] at -0.068 [s]



FMVSS 201U - Headform Calibration Drops CA5102 - March 31, 2010



**PART 572L
HEAD DROP PRE-TEST**

MANUFACTURER:		FIRST TECHNOLOGY SAFETY SYSTEMS	
SERIAL NUMBER:		805	
CALIBRATION DATE:		March 24, 2010	
TEST PARAMETER	SPECIFICATION		TEST RESULTS
TEMPERATURE	19°C to 26°C		21 °C
RELATIVE HUMIDITY	10% to 70%		29%
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs		268.2 Gs
PEAK LATERAL ACCELERATION	15 Gs Maximum		7.2 Gs
IS ACCELERATION CURVE UNIMODAL?	YES		YES

HEAD ACCELEROMETER CALIBRATION INFORMATION

I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 -LONGITUDINAL	ENDEVCO	7264-2000T	J25854	3/2/2010	9/2/2010
2 - LATERAL	ENDEVCO	7264-2000T	J37496	3/2/2010	9/2/2010
3 - VERTICAL	ENDEVCO	7264-2000T	J41016	3/2/2010	9/2/2010

REMARKS:

FMVSS 201U - Headform Calibration Drops

Part 572E Head Drop

Calibration Date: March 24, 2010

Serial No: 0805

Work File: fmh

-----TEST RESULTS-----

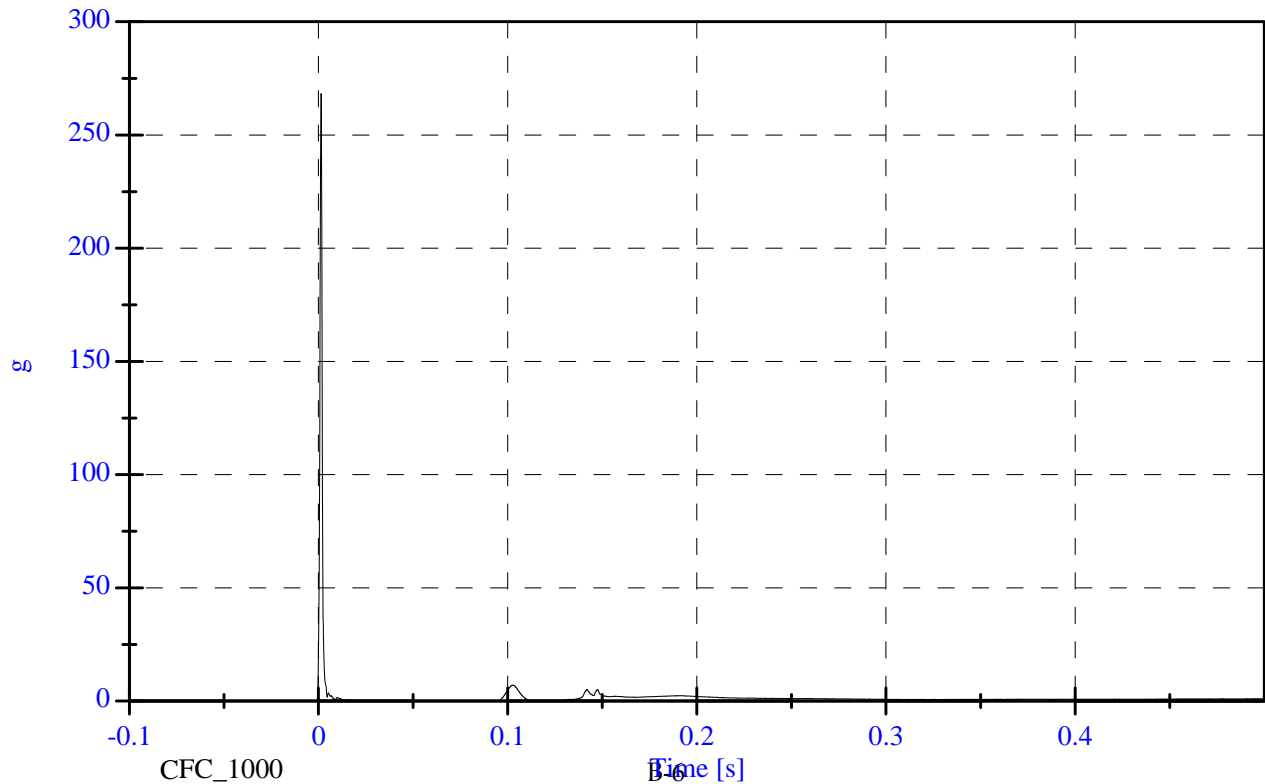
<u>TEST CONDITION</u>	<u>PARAMETERS</u>	<u>RESULTS</u>	<u>STATUS</u>
Lab Temperature:	19-26 C	20.6	Passed
Lab Humidity	10-70 %	29.00 %	Passed
Peak Resultant Accel.:	225-275 Gs	268.24 Gs	Passed
Peak Lateral Accel.:	15 Gs Max	7.22 Gs	Passed
Curve Percent NonModal:	< 10%	2.63 %	Passed

FMVSS 201U - Headform Calibration Drops

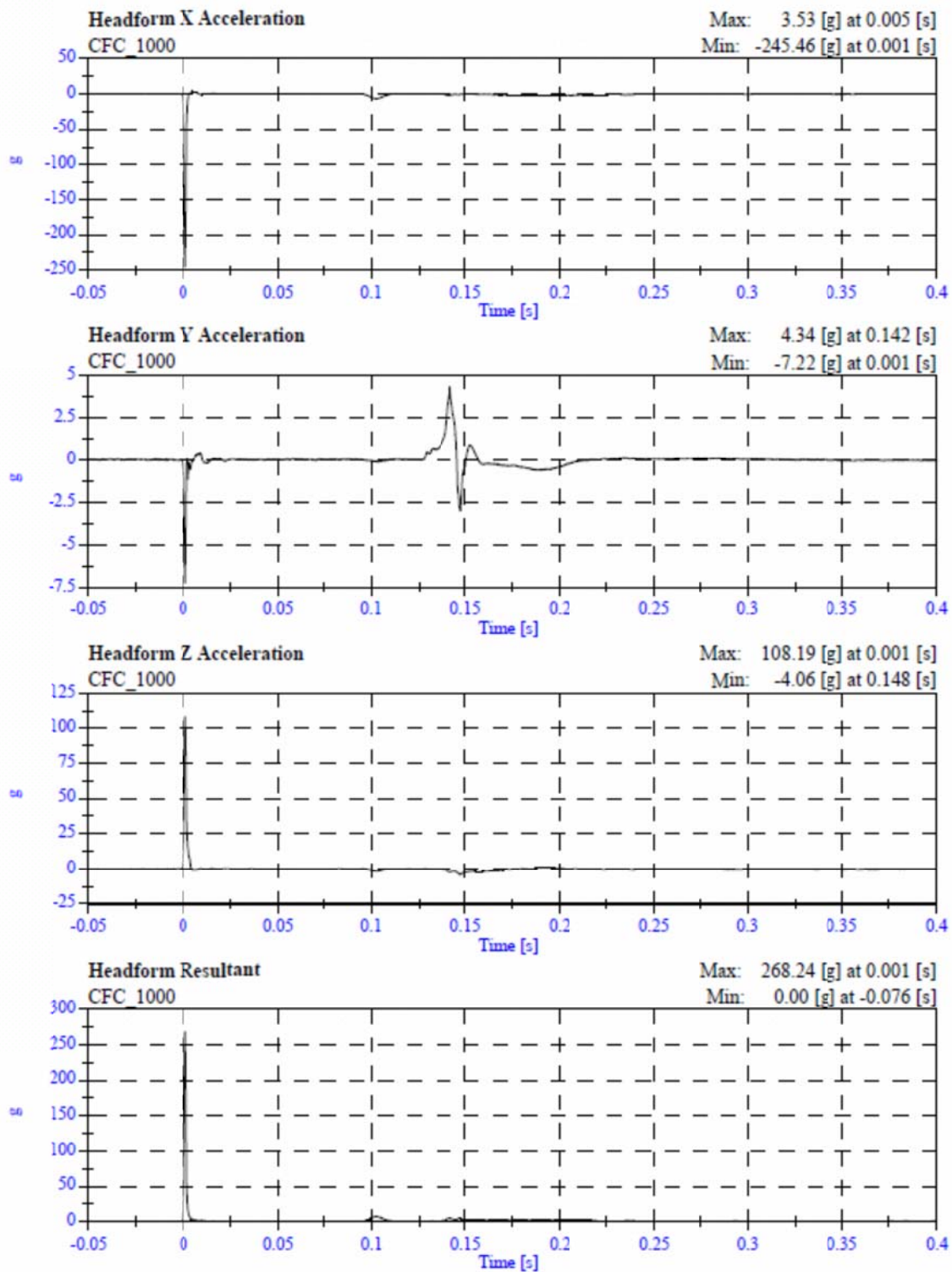
Headform Resultant

Max: 268.2 [g] at 0.001 [s]

Min: 0.0 [g] at -0.076 [s]



FMVSS 201U - Headform Calibration Drops CA5102 - March 24, 2010



**PART 572L
HEAD DROP PRE-TEST**

MANUFACTURER:		DENTON ATD INC.	
SERIAL NUMBER:		0355	
CALIBRATION DATE:		March 24, 2010	
TEST PARAMETER	SPECIFICATION		TEST RESULTS
TEMPERATURE	19°C to 26°C		21 °C
RELATIVE HUMIDITY	10% to 70%		30%
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs		265.3 Gs
PEAK LATERAL ACCELERATION	15 Gs Maximum		10.6 Gs
IS ACCELERATION CURVE UNIMODAL?	YES		YES

HEAD ACCELEROMETER CALIBRATION INFORMATION

I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 -LONGITUDINAL	ENDEVCO	7264-2000T	J28671	3/2/2010	9/2/2010
2 - LATERAL	ENDEVCO	7264-2000T	J32779	3/2/2010	9/2/2010
3 - VERTICAL	ENDEVCO	7264-2000T	J31020	3/2/2010	9/2/2010

REMARKS:

FMVSS 201U - Headform Calibration Drops

Part 572E Head Drop

Calibration Date: March 24, 2010

Serial No: 0355

Work File: fmh

-----TEST RESULTS-----

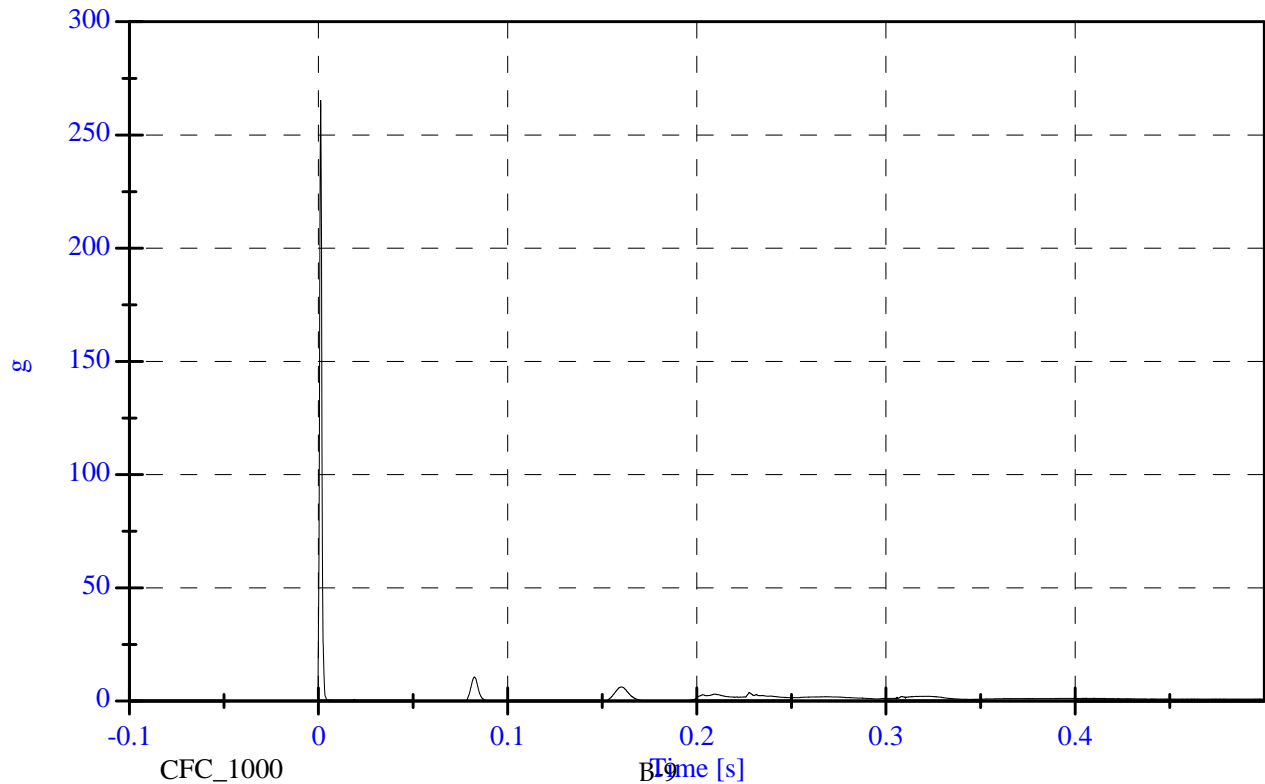
<u>TEST CONDITION</u>	<u>PARAMETERS</u>	<u>RESULTS</u>	<u>STATUS</u>
Lab Temperature:	19-26 C	20.6	Passed
Lab Humidity	10-70 %	30.00 %	Passed
Peak Resultant Accel.:	225-275 Gs	265.31 Gs	Passed
Peak Lateral Accel.:	15 Gs Max	10.61 Gs	Passed
Curve Percent NonModal:	< 10%	4.01 %	Passed

FMVSS 201U - Headform Calibration Drops

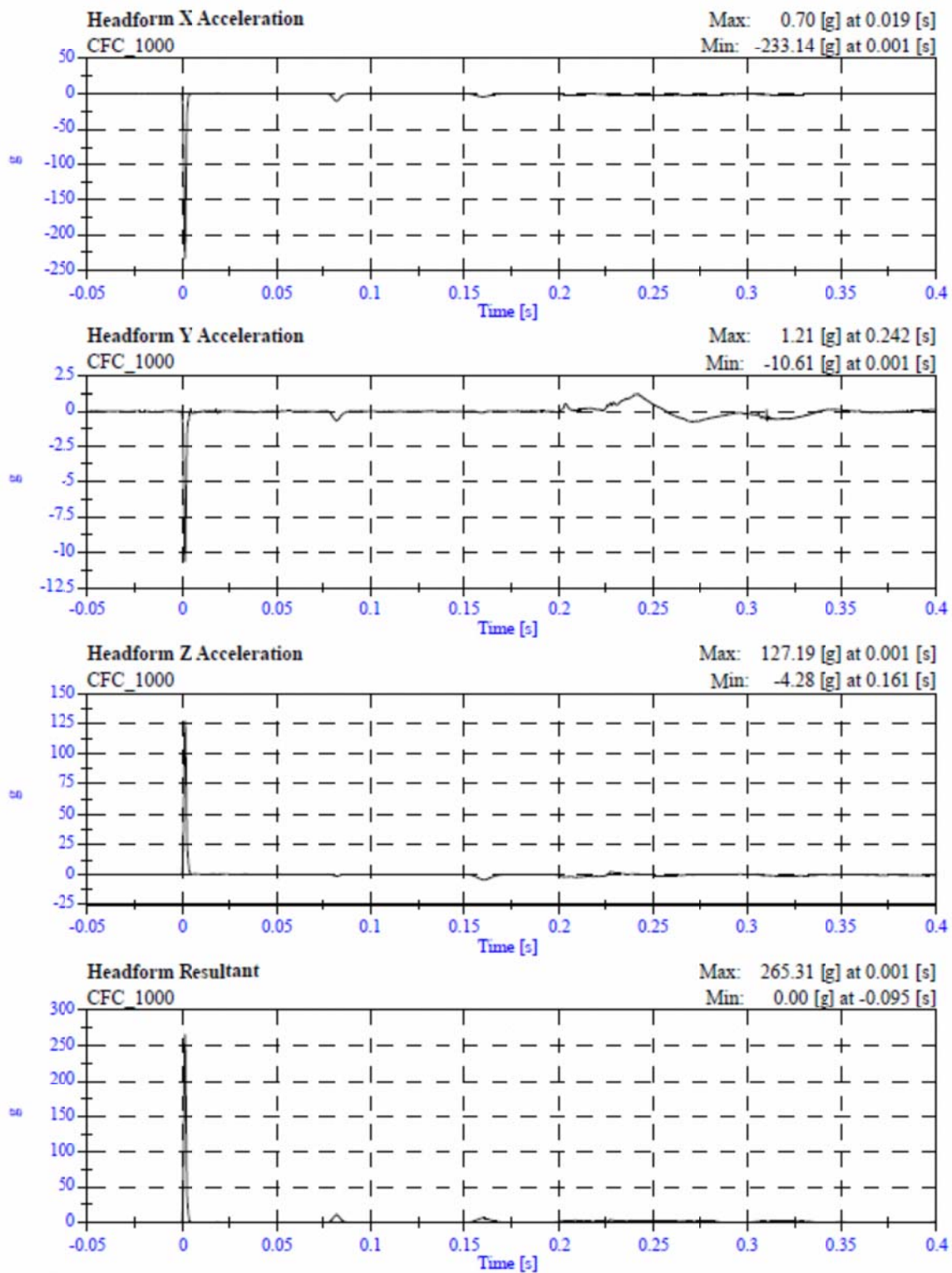
Headform Resultant

Max: 265.3 [g] at 0.001 [s]

Min: 0.0 [g] at -0.095 [s]



FMVSS 201U - Headform Calibration Drops CA5102 - March 24, 2010



**PART 572L
HEAD DROP PRE-TEST**

MANUFACTURER:		DENTON ATD INC.	
SERIAL NUMBER:		1140	
CALIBRATION DATE:		March 24, 2010	
TEST PARAMETER	SPECIFICATION		TEST RESULTS
TEMPERATURE	19°C to 26°C		20 °C
RELATIVE HUMIDITY	10% to 70%		30%
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs		255.8 Gs
PEAK LATERAL ACCELERATION	15 Gs Maximum		6.9 Gs
IS ACCELERATION CURVE UNIMODAL?	YES		YES

HEAD ACCELEROMETER CALIBRATION INFORMATION

I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 -LONGITUDINAL	ENDEVCO	7264-2000T	J40994	3/3/2010	9/3/2010
2 - LATERAL	ENDEVCO	7264-2000T	J45450	3/3/2010	9/3/2010
3 - VERTICAL	ENDEVCO	7264-2000T	J41007	3/3/2010	9/3/2010

REMARKS:

FMVSS 201U - Headform Calibration Drops

Part 572E Head Drop

Calibration Date: March 24, 2010

Serial No: 1140

Work File: fmh

-----TEST RESULTS-----

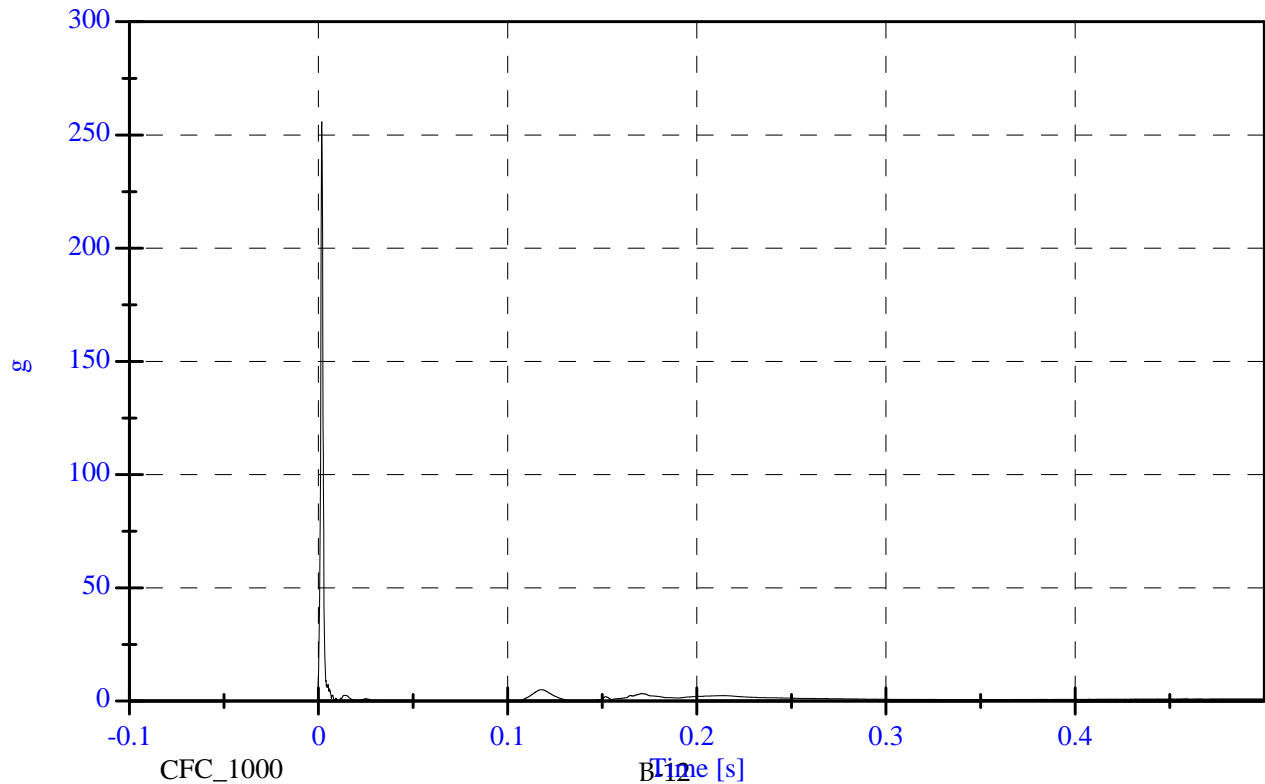
<u>TEST CONDITION</u>	<u>PARAMETERS</u>	<u>RESULTS</u>	<u>STATUS</u>
Lab Temperature:	19-26 C	20.0	Passed
Lab Humidity	10-70 %	30.00 %	Passed
Peak Resultant Accel.:	225-275 Gs	255.82 Gs	Passed
Peak Lateral Accel.:	15 Gs Max	6.85 Gs	Passed
Curve Percent NonModal:	< 10%	3.55 %	Passed

FMVSS 201U - Headform Calibration Drops

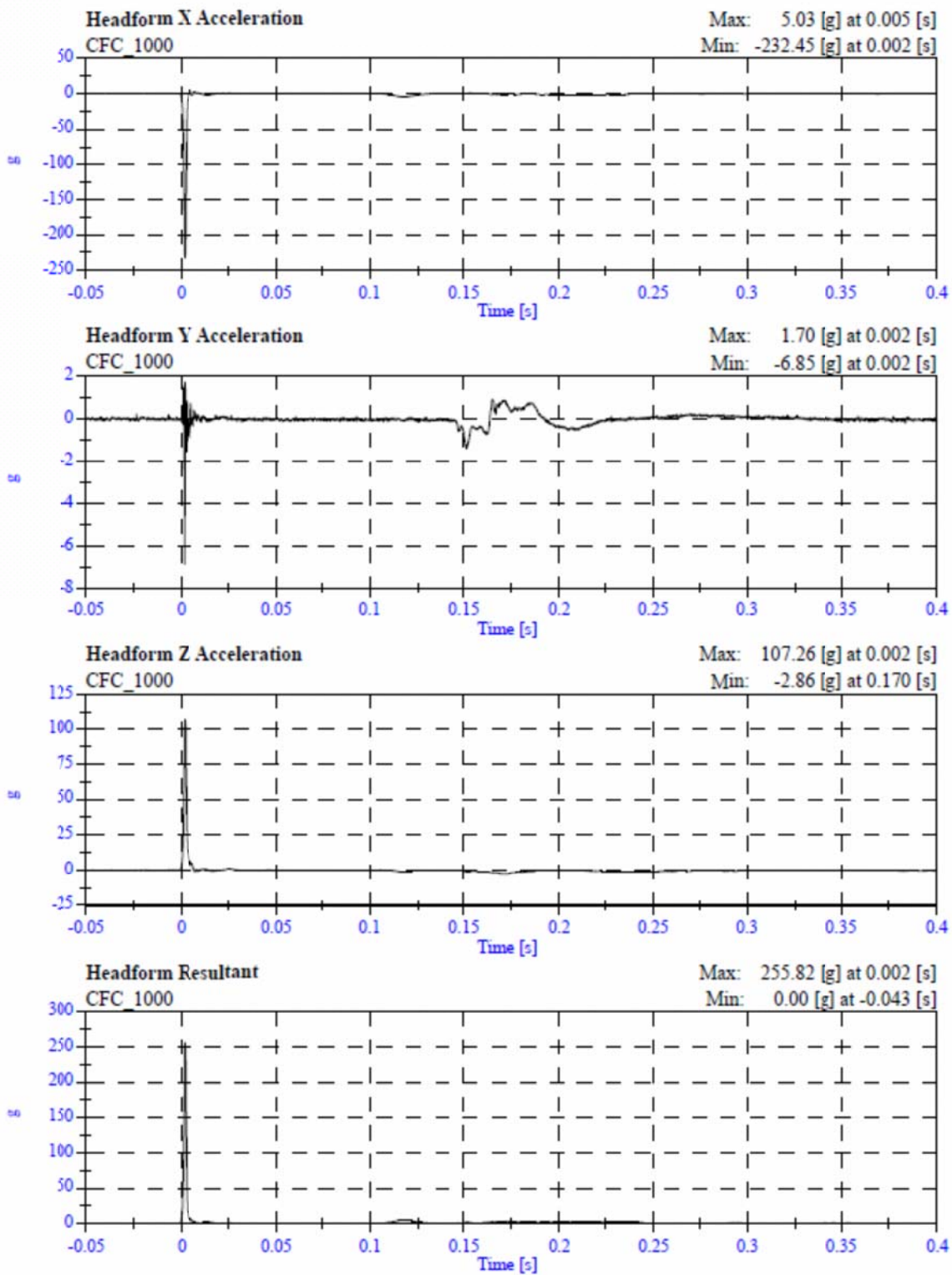
Headform Resultant

Max: 255.8 [g] at 0.002 [s]

Min: 0.0 [g] at -0.043 [s]



FMVSS 201U - Headform Calibration Drops CA5102 - March 24, 2010



**PART 572L
HEAD DROP PRE-TEST**

MANUFACTURER:		FIRST TECHNOLOGY SAFETY SYSTEMS	
SERIAL NUMBER:		1142	
CALIBRATION DATE:		March 24, 2010	
TEST PARAMETER	SPECIFICATION		TEST RESULTS
TEMPERATURE	19°C to 26°C		21 °C
RELATIVE HUMIDITY	10% to 70%		30%
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs		260.9 Gs
PEAK LATERAL ACCELERATION	15 Gs Maximum		8.5 Gs
IS ACCELERATION CURVE UNIMODAL?	YES		YES

HEAD ACCELEROMETER CALIBRATION INFORMATION

I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 -LONGITUDINAL	ENDEVCO	7264-2000T	J41006	4/8/2010	10/8/2010
2 - LATERAL	ENDEVCO	7264-2000T	J33030	4/8/2010	10/8/2010
3 - VERTICAL	ENDEVCO	7264-2000T	J31009	4/8/2010	10/8/2010

REMARKS:

FMVSS 201U - Headform Calibration Drops

Part 572E Head Drop

Calibration Date: March 31, 2010

Serial No: 1142

Work File: fmh

-----TEST RESULTS-----

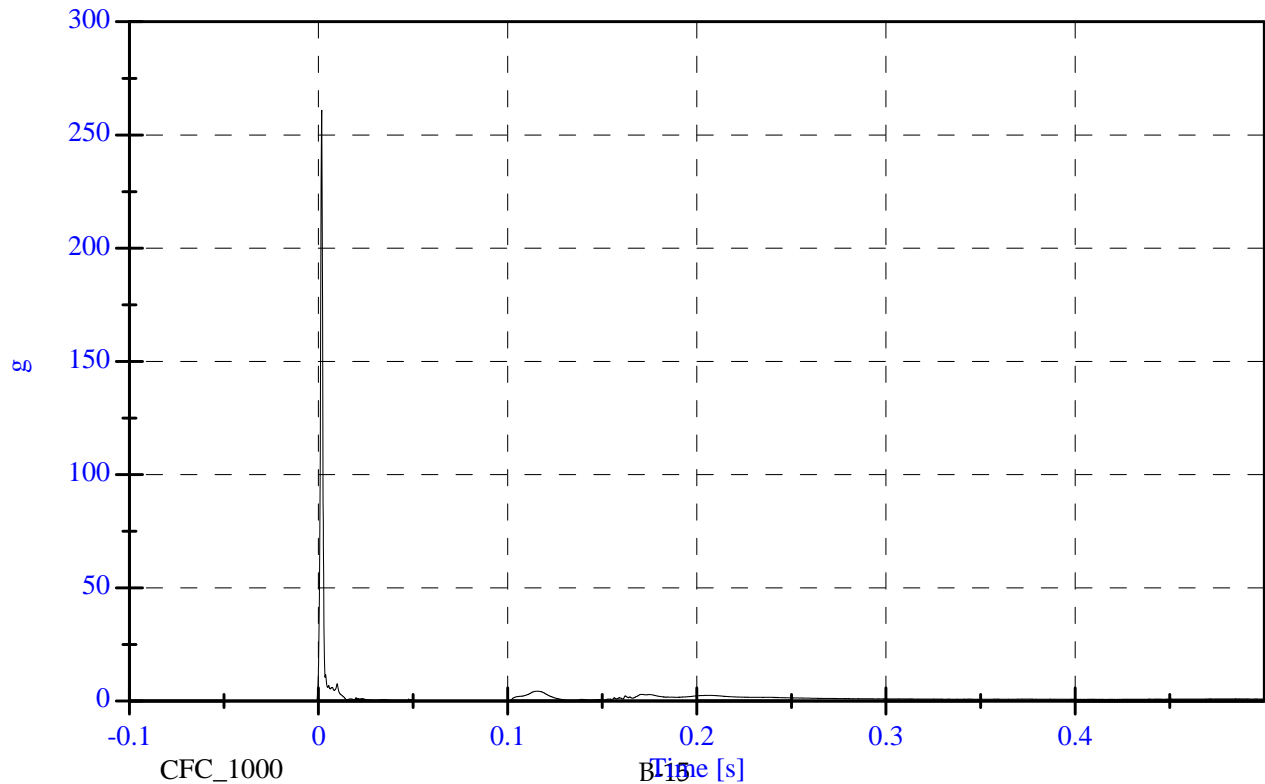
<u>TEST CONDITION</u>	<u>PARAMETERS</u>	<u>RESULTS</u>	<u>STATUS</u>
Lab Temperature:	19-26 C	20.6	Passed
Lab Humidity	10-70 %	30.00 %	Passed
Peak Resultant Accel.:	225-275 Gs	260.92 Gs	Passed
Peak Lateral Accel.:	15 Gs Max	8.55 Gs	Passed
Curve Percent NonModal:	< 10%	4.46 %	Passed

FMVSS 201U - Headform Calibration Drops

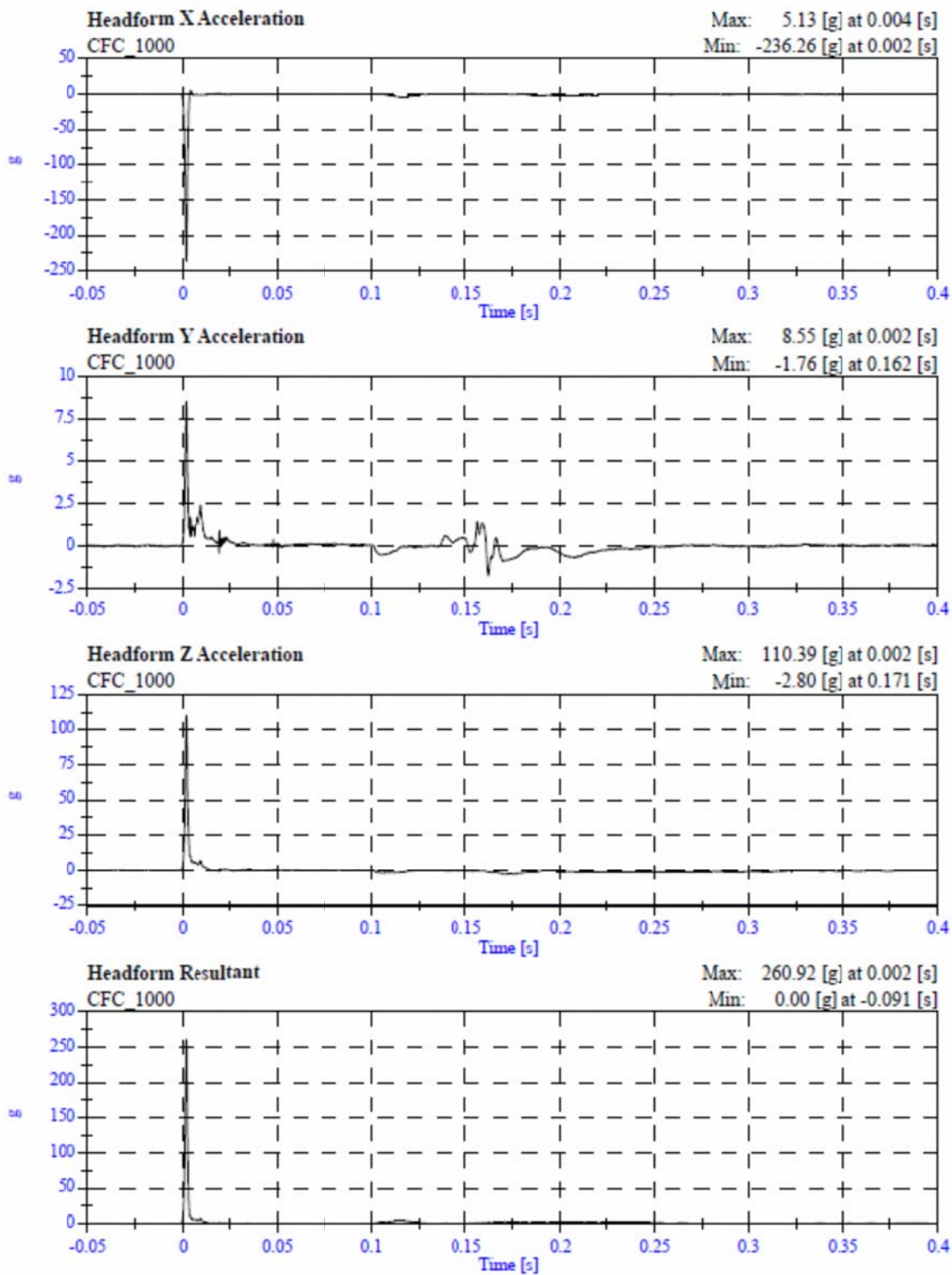
Headform Resultant

Max: 260.9 [g] at 0.002 [s]

Min: 0.0 [g] at -0.091 [s]



FMVSS 201U - Headform Calibration Drops CA5102 - March 31, 2010



**PART 572L
HEAD DROP POST-TEST**

MANUFACTURER:		DENTON ATD INC.	
SERIAL NUMBER:		0062	
CALIBRATION DATE:		April 7, 2010	
TEST PARAMETER	SPECIFICATION		TEST RESULTS
TEMPERATURE	19°C to 26°C		23 °C
RELATIVE HUMIDITY	10% to 70%		42%
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs		248.2 Gs
PEAK LATERAL ACCELERATION	15 Gs Maximum		3.5 Gs
IS ACCELERATION CURVE UNIMODAL?	YES		YES

HEAD ACCELEROMETER CALIBRATION INFORMATION

I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 -LONGITUDINAL	ENDEVCO	7264-2000T	J45546	3/30/2010	9/30/2010
2 - LATERAL	ENDEVCO	7264-2000T	J45485	3/30/2010	9/30/2010
3 - VERTICAL	ENDEVCO	7264-2000T	J45406	3/30/2010	9/30/2010

REMARKS:

FMVSS 201U - Headform Calibration Drops

Part 572E Head Drop

Calibration Date: April 07, 2010

Serial No: 0062

Work File: fmh

-----TEST RESULTS-----

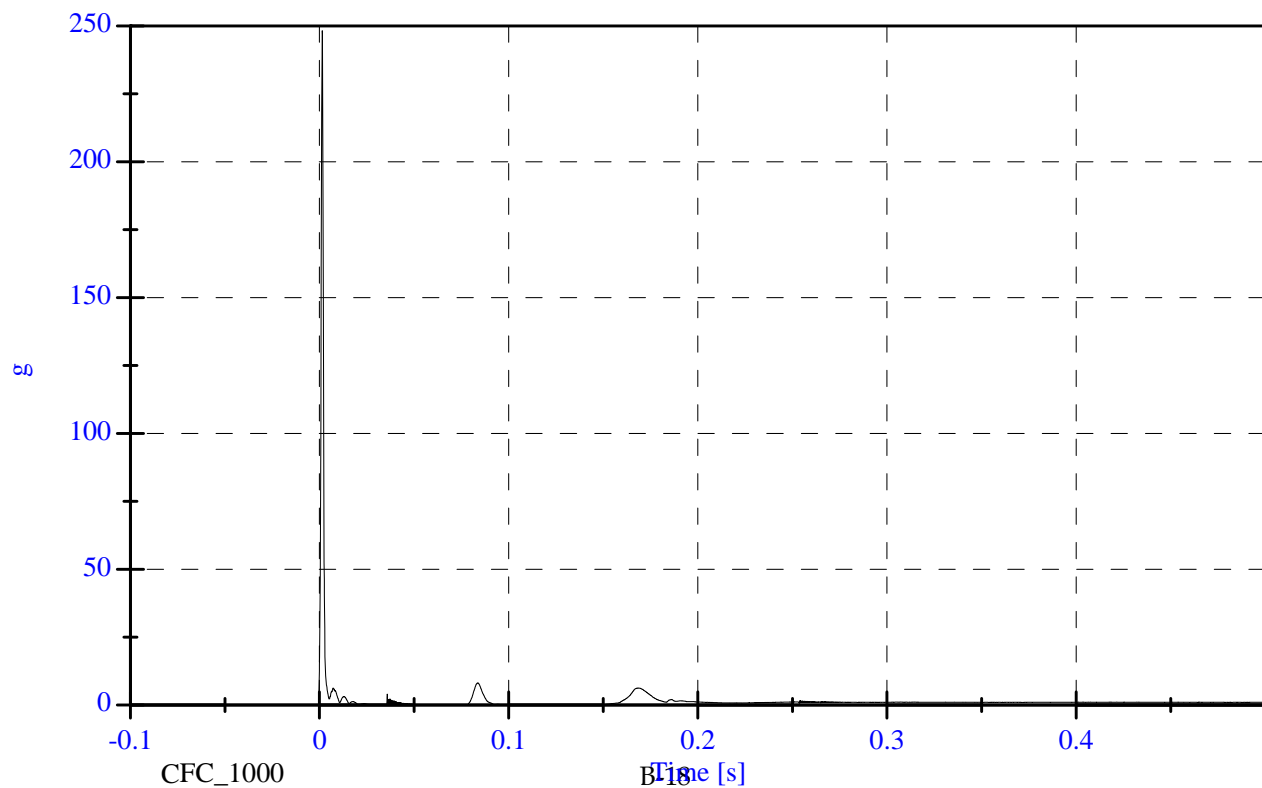
<u>TEST CONDITION</u>	<u>PARAMETERS</u>	<u>RESULTS</u>	<u>STATUS</u>
Lab Temperature:	19-26 C	23.3	Passed
Lab Humidity	10-70 %	42.00 %	Passed
Peak Resultant Accel.:	225-275 Gs	248.22 Gs	Passed
Peak Lateral Accel.:	15 Gs Max	3.45 Gs	Passed
Curve Percent NonModal:	< 10%	3.28 %	Passed

FMVSS 201U - Headform Calibration Drops

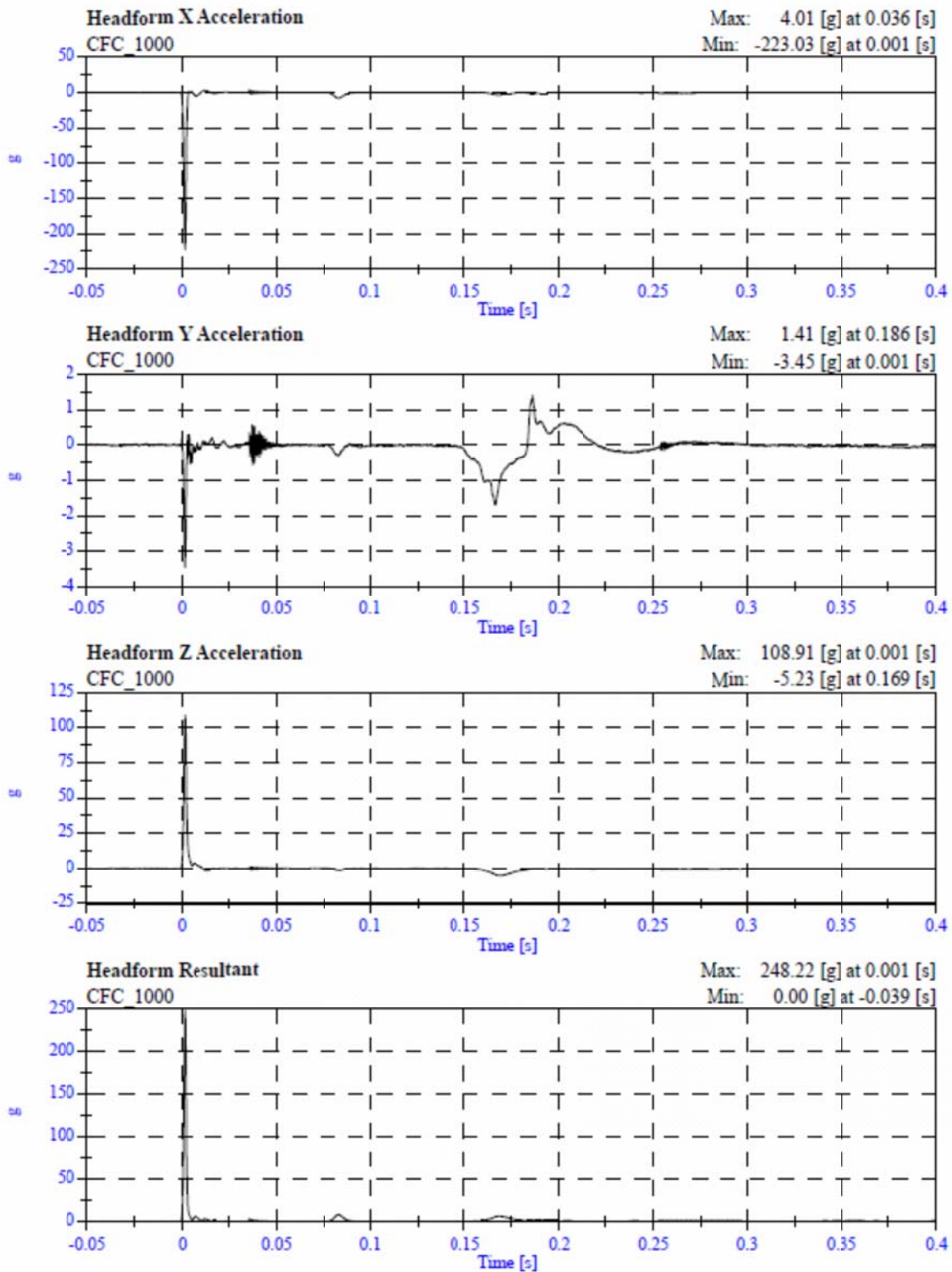
Headform Resultant

Max: 248.2 [g] at 0.001 [s]

Min: 0.0 [g] at -0.039 [s]



FMVSS 201U - Headform Calibration Drops CA5102 - April 07, 2010



**PART 572L
HEAD DROP POST-TEST**

MANUFACTURER:		FIRST TECHNOLOGY SAFETY SYSTEMS	
SERIAL NUMBER:		805	
CALIBRATION DATE:		April 7, 2010	
TEST PARAMETER	SPECIFICATION		TEST RESULTS
TEMPERATURE	19°C to 26°C		24°C
RELATIVE HUMIDITY	10% to 70%		44%
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs		225.8 Gs
PEAK LATERAL ACCELERATION	15 Gs Maximum		3.4 Gs
IS ACCELERATION CURVE UNIMODAL?	YES		YES

HEAD ACCELEROMETER CALIBRATION INFORMATION

I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J25854	3/2/2010	9/2/2010
2 - LATERAL	ENDEVCO	7264-2000T	J37496	3/2/2010	9/2/2010
3 - VERTICAL	ENDEVCO	7264-2000T	J41016	3/2/2010	9/2/2010

REMARKS:

FMVSS 201U - Headform Calibration Drops

Part 572E Head Drop

Calibration Date: April 07, 2010

Serial No: 0805

Work File: fmh

-----TEST RESULTS-----

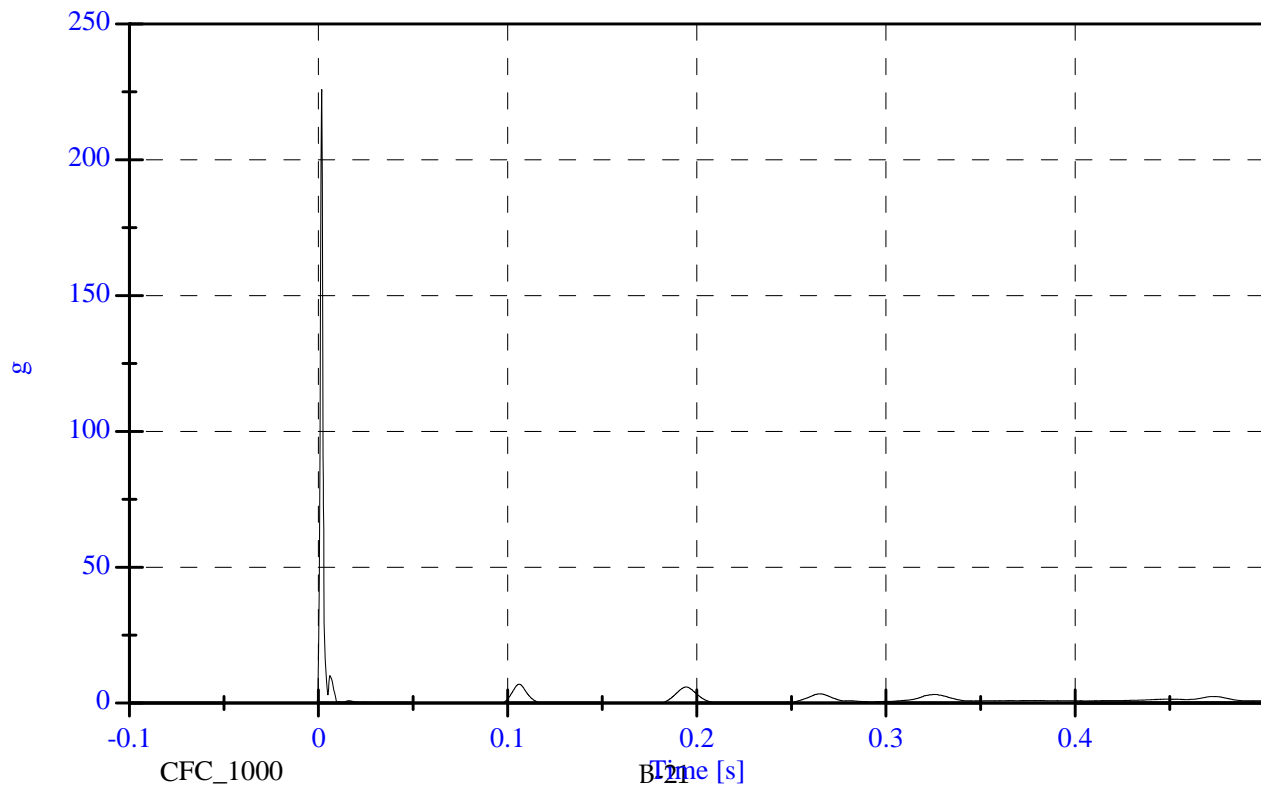
<u>TEST CONDITION</u>	<u>PARAMETERS</u>	<u>RESULTS</u>	<u>STATUS</u>
Lab Temperature:	19-26 C	23.9	Passed
Lab Humidity	10-70 %	44.00 %	Passed
Peak Resultant Accel.:	225-275 Gs	225.84 Gs	Passed
Peak Lateral Accel.:	15 Gs Max	3.44 Gs	Passed
Curve Percent NonModal:	< 10%	4.46 %	Passed

FMVSS 201U - Headform Calibration Drops

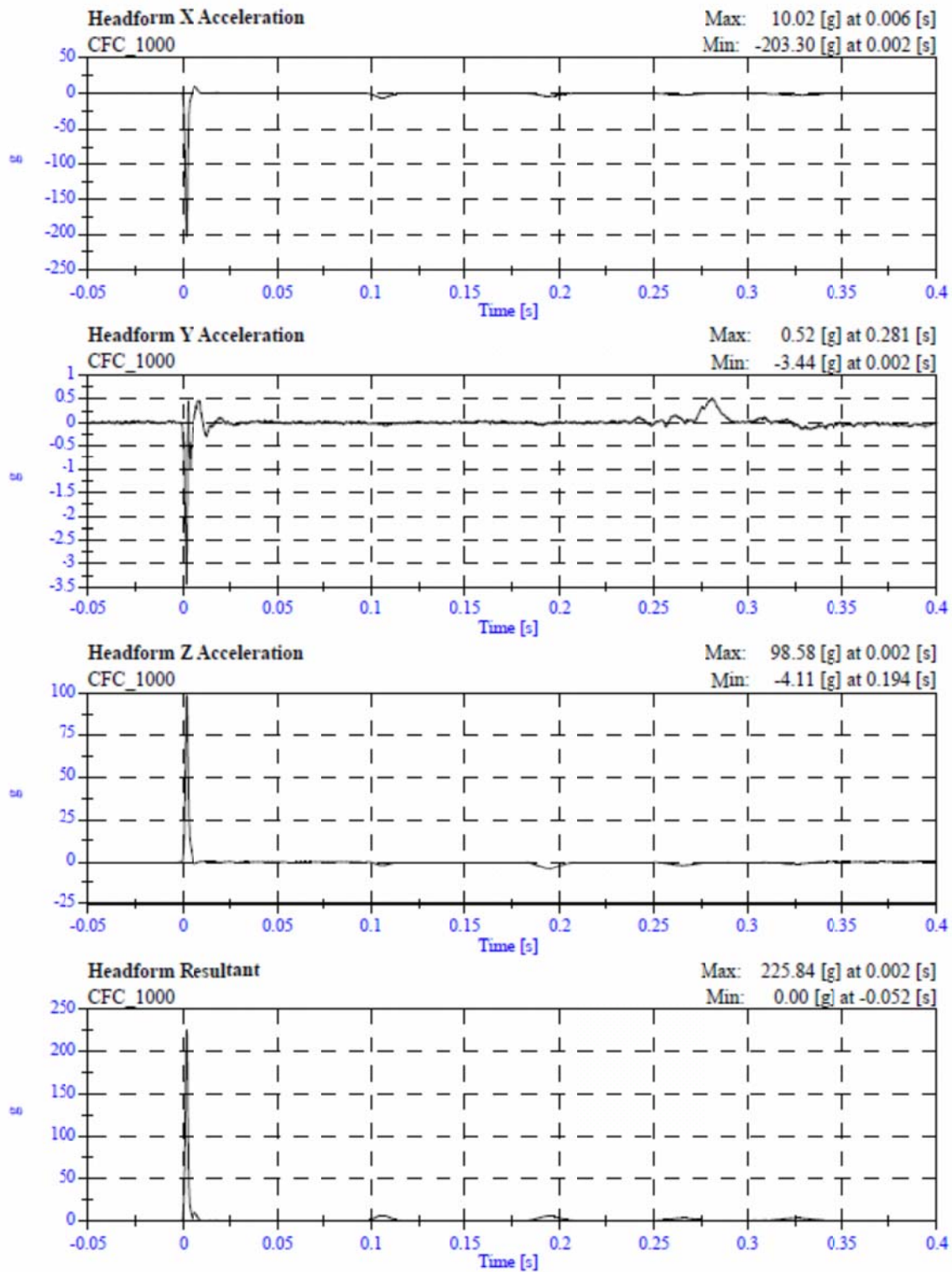
Headform Resultant

Max: 225.8 [g] at 0.002 [s]

Min: 0.0 [g] at -0.052 [s]



FMVSS 210U - Headform Calibration Drops CA5102 - April 07, 2010



**PART 572L
HEAD DROP POST-TEST**

MANUFACTURER:		DENTON ATD INC.	
SERIAL NUMBER:		0355	
CALIBRATION DATE:		April 7, 2010	
TEST PARAMETER	SPECIFICATION		TEST RESULTS
TEMPERATURE	19°C to 26°C		23 °C
RELATIVE HUMIDITY	10% to 70%		43%
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs		265.3 Gs
PEAK LATERAL ACCELERATION	15 Gs Maximum		9.0 Gs
IS ACCELERATION CURVE UNIMODAL?	YES		YES

HEAD ACCELEROMETER CALIBRATION INFORMATION

I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 -LONGITUDINAL	ENDEVCO	7264-2000T	J28671	3/2/2010	9/2/2010
2 - LATERAL	ENDEVCO	7264-2000T	J32779	3/2/2010	9/2/2010
3 - VERTICAL	ENDEVCO	7264-2000T	J31020	3/2/2010	9/2/2010

REMARKS:

FMVSS 201U - Headform Calibration Drops

Part 572E Head Drop

Calibration Date: April 07, 2010

Serial No: 0355

Work File: fmh

-----TEST RESULTS-----

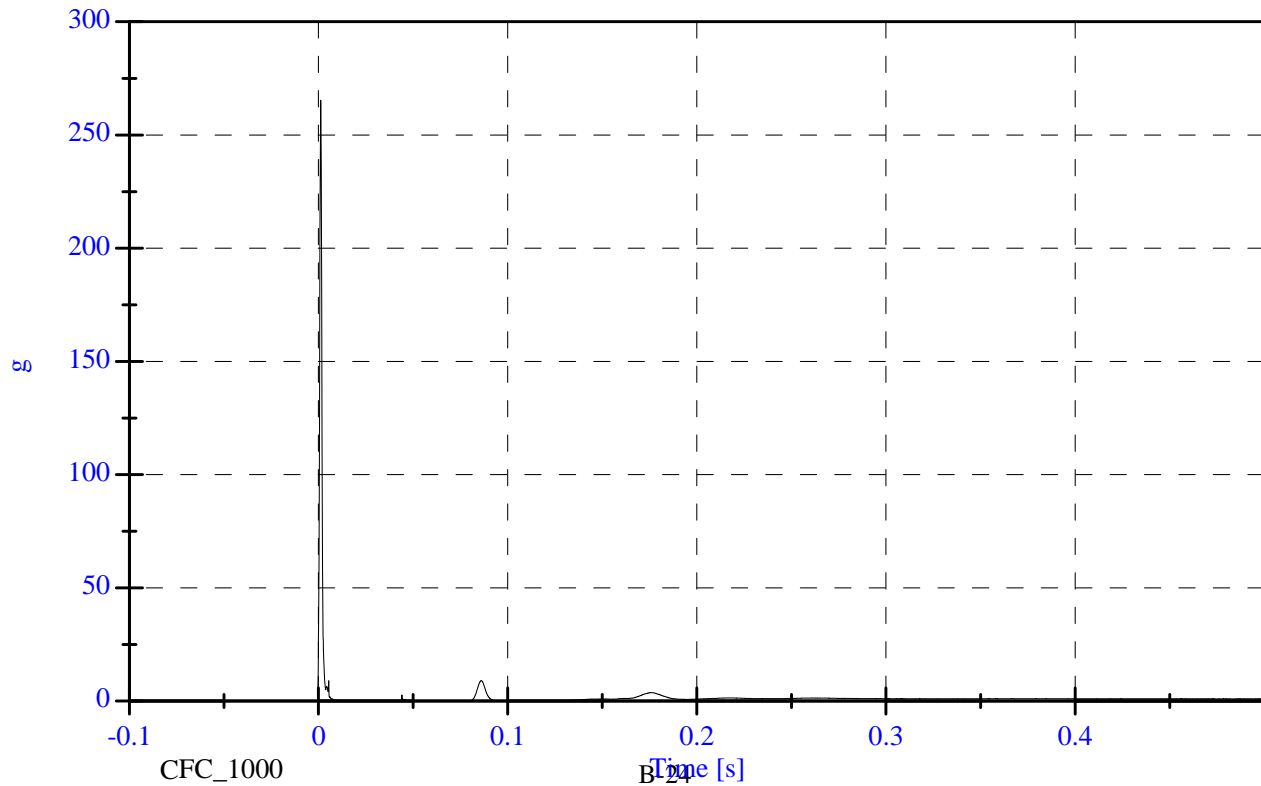
<u>TEST CONDITION</u>	<u>PARAMETERS</u>	<u>RESULTS</u>	<u>STATUS</u>
Lab Temperature:	19-26 C	23.3	Passed
Lab Humidity	10-70 %	43.00 %	Passed
Peak Resultant Accel.:	225-275 Gs	265.34 Gs	Passed
Peak Lateral Accel.:	15 Gs Max	9.02 Gs	Passed
Curve Percent NonModal:	< 10%	3.41 %	Passed

FMVSS 201U - Headform Calibration Drops

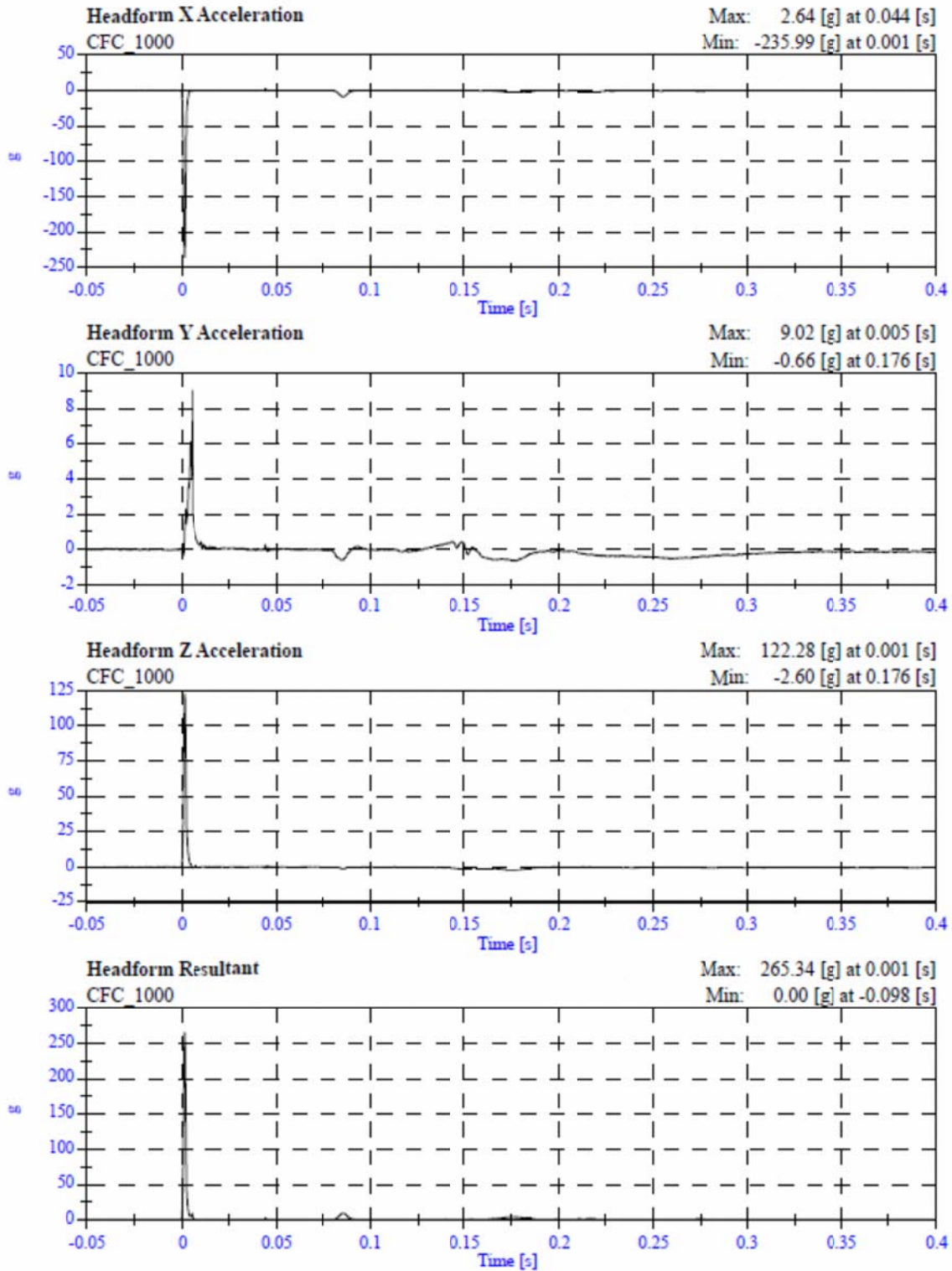
Headform Resultant

Max: 265.3 [g] at 0.001 [s]

Min: 0.0 [g] at -0.098 [s]



FMVSS 201U - Headform Calibration Drops CA5102 - April 07, 2010



**PART 572L
HEAD DROP POST-TEST**

MANUFACTURER:		FIRST TECHNOLOGY SAFETY SYSTEMS	
SERIAL NUMBER:		1140	
CALIBRATION DATE:		April 7, 2010	
TEST PARAMETER	SPECIFICATION		TEST RESULTS
TEMPERATURE	19°C to 26°C		23 °C
RELATIVE HUMIDITY	10% to 70%		42%
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs		274.2 Gs
PEAK LATERAL ACCELERATION	15 Gs Maximum		10.3 Gs
IS ACCELERATION CURVE UNIMODAL?	YES		YES

HEAD ACCELEROMETER CALIBRATION INFORMATION

I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 -LONGITUDINAL	ENDEVCO	7264-2000T	J40994	3/3/2010	9/3/2010
2 - LATERAL	ENDEVCO	7264-2000T	J45450	3/3/2010	9/3/2010
3 - VERTICAL	ENDEVCO	7264-2000T	J41007	3/3/2010	9/3/2010

REMARKS:

FMVSS 201U - Headform Calibration Drops

Part 572E Head Drop

Calibration Date: April 07, 2010

Serial No: 1140

Work File: fmh

-----TEST RESULTS-----

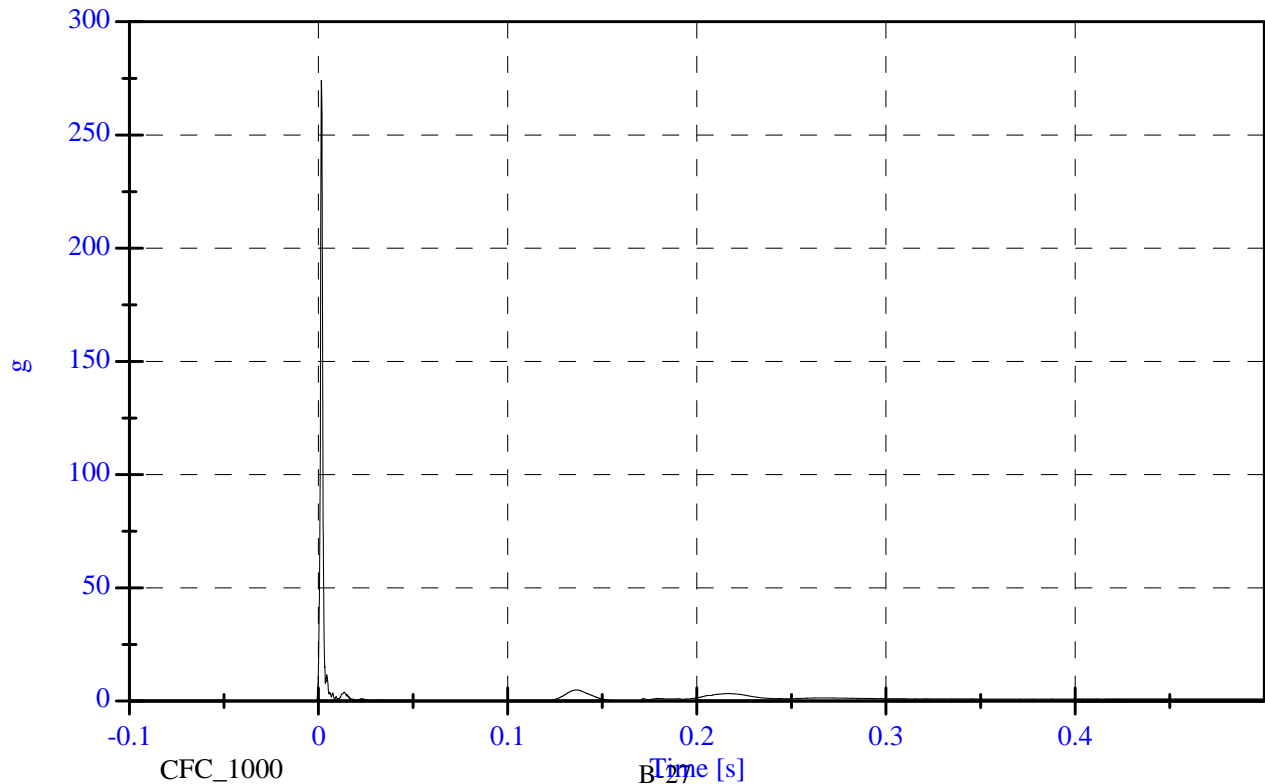
<u>TEST CONDITION</u>	<u>PARAMETERS</u>	<u>RESULTS</u>	<u>STATUS</u>
Lab Temperature:	19-26 C	23.3	Passed
Lab Humidity	10-70 %	42.00 %	Passed
Peak Resultant Accel.:	225-275 Gs	274.17 Gs	Passed
Peak Lateral Accel.:	15 Gs Max	10.34 Gs	Passed
Curve Percent NonModal:	< 10%	5.57 %	Passed

FMVSS 201U - Headform Calibration Drops

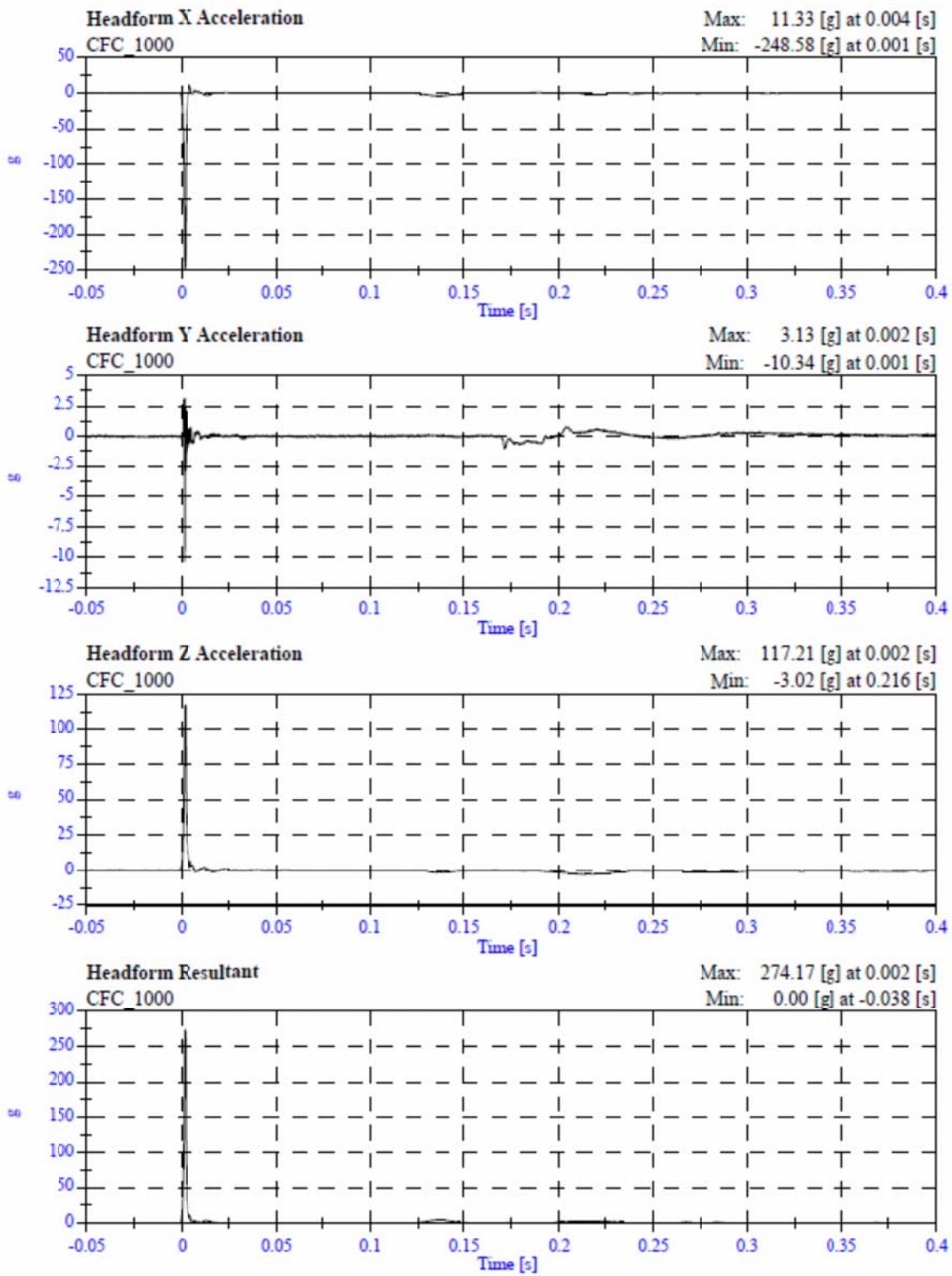
Headform Resultant

Max: 274.2 [g] at 0.001 [s]

Min: 0.0 [g] at -0.038 [s]



FMVSS 201U - Headform Calibration Drops CA5102 - April 07, 2010



**PART 572L
HEAD DROP POST-TEST**

MANUFACTURER:		FIRST TECHNOLOGY SAFETY SYSTEMS	
SERIAL NUMBER:		1142	
CALIBRATION DATE:		April 14, 2010	
TEST PARAMETER	SPECIFICATION		TEST RESULTS
TEMPERATURE	19°C to 26°C		23 °C
RELATIVE HUMIDITY	10% to 70%		19%
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs		259.6 Gs
PEAK LATERAL ACCELERATION	15 Gs Maximum		10.7 Gs
IS ACCELERATION CURVE UNIMODAL?	YES		YES

HEAD ACCELEROMETER CALIBRATION INFORMATION

I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 -LONGITUDINAL	ENDEVCO	7264-2000T	J41006	4/8/2010	10/8/2010
2 - LATERAL	ENDEVCO	7264-2000T	J33030	4/8/2010	10/8/2010
3 - VERTICAL	ENDEVCO	7264-2000T	J31009	4/8/2010	10/8/2010

REMARKS:

The auto generated page for the 1142 Post-Test lists the calibration data as May 7, 2008. This cannot be correct. Instead of using this calibration report, as proof the headform was in calibration, the 1142 Post-Test calibration report from the successive 201u test report has been used. Please note the 1142 headform has not changed from one test to the next; all accelerometer serial numbers are the same. The 1142 Post-Test calibration from the successive 201u was found to be intolerance.

FMVSS 201U - Headform Calibration Drops

Part 572E Head Drop

Calibration Date: April 14, 2010

Serial No: 1142

Work File: fmh

-----TEST RESULTS-----

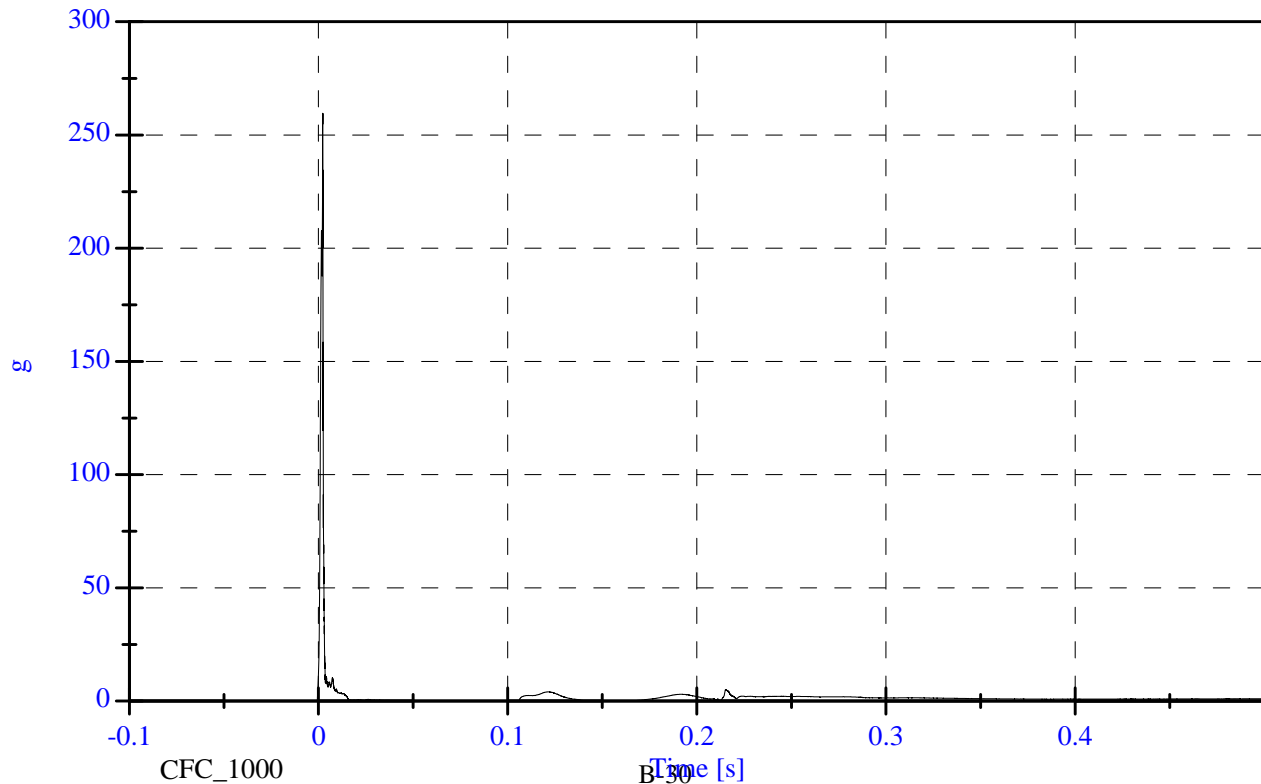
<u>TEST CONDITION</u>	<u>PARAMETERS</u>	<u>RESULTS</u>	<u>STATUS</u>
Lab Temperature:	19-26 C	23.3	Passed
Lab Humidity	10-70 %	19.00 %	Passed
Peak Resultant Accel.:	225-275 Gs	259.59 Gs	Passed
Peak Lateral Accel.:	15 Gs Max	10.68 Gs	Passed
Curve Percent NonModal:	< 10%	6.52 %	Passed

FMVSS 201U - Headform Calibration Drops

Headform Resultant

Max: 259.6 [g] at 0.002 [s]

Min: 0.0 [g] at -0.027 [s]



FMVSS 201U - Headform Calibration Drops CA5103 - April 14, 2010

